

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK**

ALLIANZ GLOBAL INVESTORS GMBH;
ANCHORAGE CAPITAL GROUP, L.L.C.; ANDRA AP-
FONDEN; BLACKROCK, INC.; BLUECREST
CAPITAL MANAGEMENT LIMITED; BREVAN
HOWARD EMERGING MARKETS STRATEGIES
MASTER FUND LIMITED; CALIFORNIA STATE
TEACHERS' RETIREMENT SYSTEM; ERSTE
ABWICKLUNGSANSTALT; FJARDE AP-FONDEN;
FORSTA AP-FONDEN; NORGES BANK; PFA
PENSION FORSIKRINGSAKTIESELSKAB; PFA
KAPITALFORENING; PACIFIC INVESTMENT
MANAGEMENT COMPANY LLC; PORTIGON AG;
PENSION RESERVES INVESTMENT MANAGEMENT
BOARD OF MASSACHUSETTS; SEI TRUST
COMPANY; TREDJE AP-FONDEN; Allianz Global
Investors Ireland Limited; Carne Global Fund Managers
(Ireland) Limited; Allianz Global Investors Fund Société
d'Investissement à Capital Variable (f/k/a Dresdner Global
Strategies Fund Société d'Investissement à Capital
Variable); Allianz European Pension Investments Société
d'Investissement à Capital Variable; Allianz Global
Investors Fund II Société d'Investissement à Capital
Variable; Allianz Institutional Investors Series Société
d'Investissement à Capital Variable; RP Rendite Plus
Société d'Investissement à Capital Variable; ALLIANZ
ACTIO FRANCE Société d'Investissement à Capital
Variable (f/k/a AGF ACTIO FRANCE Société
d'Investissement à Capital Variable); ALLIANZ
ACTIONS EURO Société d'Investissement à Capital
Variable (f/k/a AGF EURO ACTIONS Société
d'Investissement à Capital Variable); ALLIANZ
ACTIONS FRANCE Société d'Investissement à Capital
Variable (f/k/a AGF EPARGNE ACTIONS Société
d'Investissement à Capital Variable); ALLIANZ
FONCIER Société d'Investissement à Capital Variable
(f/k/a AGF FONCIER Société d'Investissement à Capital
Variable); ALLIANZ IMMO Société d'Investissement à
Capital Variable (f/k/a AGF IMMO Société
d'Investissement à Capital Variable); ALLIANZ
MONETAIRE Société d'Investissement à Capital Variable
(f/k/a AGF MONETAIRE Société d'Investissement à
Capital Variable); ALLIANZ OBLIGATIONS
INTERNATIONALES Société d'Investissement à Capital

Case No. 1:18-cv-10364

COMPLAINT

JURY TRIAL DEMANDED

Variable (f/k/a AGF OBLIGATIONS INTERNATIONALES Société d'Investissement à Capital Variable); ALLIANZ SECURITE Société d'Investissement à Capital Variable (f/k/a PHENIX SECURITE Société d'Investissement à Capital Variable); ALLIANZ VALEURS DURABLE Société d'Investissement à Capital Variable (f/k/a AGF VALEURS DURABLE Société d'Investissement à Capital Variable); ALLIANZ EPARGNE RETRAITE Société d'Investissement à Capital Variable; ALLIANZ EPARGNE SALARIALE Société d'Investissement à Capital Variable; ALLIANZ PFIZER Société d'Investissement à Capital Variable; Allianz International Investment Funds OEIC; Allianz UK & European Investment Funds OEIC; Allianz Global Investors Fund VI PLC (f/k/a dit-RCM Asian Selections Fund PLC, Dresdner RCM Asian Selections Fund PLC); Allianz Global Investors Fund X PLC (f/k/a RCM Global Series Fund PLC); Allianz Global Investors Opportunities Société d'Investissement à Capital Variable; Rogge Funds PLC; Allianz Global Investors Asia Pacific Limited, on behalf of Allianz Global Investors Choice Fund and Allianz Global Investors Trust; Allianz Global Investors Singapore Limited, on behalf of Allianz Global Investors Premier Funds; Allianz Global Investors Taiwan Limited; Allianz Global Investors U.S. LLC; Allianz Funds Multi-Strategy Trust; AllianzGI Institutional Multi-Series Trust; Premier Multi-Series VIT; Allianz Funds; Allianz Dynamic Global Bond Allocation Fund - AllianzGI Global Dynamic Allocation LLC; AllianzGI Global Growth Allocation Fund, n/k/a AllianzGI Global Dynamic Allocation Fund, a series of Allianz Funds Multi-Strategy Trust; PEA Value Fund, a series of Allianz Funds; AllianzGI NFJ All-Cap Fund, a series of Allianz Funds; Allianz AGIC Global Fund, a series of Allianz Funds; Allianz AGIC International Growth Fund, a series of Allianz Funds Multi-Strategy Trust; AllianzGI AGIC Small to Mid Cap Growth Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz OCC Equity Premium Strategy Fund, a series of Allianz Funds; Allianz NACM Global Equity 130/30 Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz PEA Value Fund, a series of Allianz Funds; Allianz AGIC International Fund, a series of Allianz Funds; Allianz AGIC International Growth Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz AGIC International Growth Opportunities Fund, n/k/a AllianzGI

International Small-Cap Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz AGIC Pacific Rim Fund, n/k/a AllianzGI Emerging Markets Opportunities Fund, a series of Allianz Funds; Allianz AGIC Target Fund, n/k/a AllianzGI Mid-Cap Fund, a series of Allianz Funds; Allianz Global Investors Capital International Systematic Fund LLC; Allianz OCC International Equity Fund, a series of Allianz Funds; Allianz OCC Renaissance Fund, a series of Allianz Funds; Allianz OCC Value Fund, a series of Allianz Funds; Allianz RCM All Alpha Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz RCM All Horizons Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz RCM Biotechnology Fund add Global Health Sciences, n/k/a AllianzGI Health Sciences Fund, a series of Allianz Funds; Allianz RCM BRIC Stars Fund, n/k/a Allianz Emerging Markets Equity Fund; Allianz RCM Disciplined International Equity Fund, a series of Allianz Funds; Allianz RCM Disciplined International Equity Fund - Fgn.Equity; Allianz RCM Dynamic Growth Fund; Allianz RCM Financial Services Fund, a series of Allianz Funds; Allianz RCM Strategic Growth Fund n/k/a AllianzGI Focused Growth Fund, a series of Allianz Funds; Allianz RCM Global Eco Trends Fund, n/k/a AllianzGI Global Water Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz RCM Global Small Cap Fund, n/k/a AllianzGI Global-Small Cap Fund, a series of Allianz Funds; ALLIANZ RCM GLOBAL SUSTAINABILITY FUND, n/k/a AllianzGI Global Sustainability Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz RCM Innovation Fund, n/k/a AllianzGI Technology Fund, a series of Allianz Funds; Allianz RCM International Opportunities Fund, a series of Allianz Funds Multi-Strategy Trust; Allianz RCM Large-Cap Growth Fund, n/k/a AllianzGI Focused Growth Fund, a series of Allianz Funds; Allianz RCM Mid-Cap Fund, n/k/a AllianzGI Mid-Cap Fund, a series of Allianz Funds; Allianz RCM Technology Fund, n/k/a AllianzGI Technology Fund, a series of Allianz Funds; AllianzGI Emerging Markets Consumer Fund, n/k/a AllianzGI Emerging Market Consumer Fund, a series of Allianz Funds Multi-Strategy Trust; AllianzGI Emerging Markets Opportunities Fund, a series of Allianz Funds; AllianzGI Emerging-Markets Small Cap, a series of Allianz Funds Multi-Strategy Trust; AllianzGI Global Equity & Convertible Income Fund, n/k/a AllianzGI Equity & Convertible Income Fund; AllianzGI Global Managed

Volatility Fund, a series of Allianz Funds Multi-Strategy Trust; AllianzGI Global Natural Resources Fund, a series of Allianz Funds; AllianzGI Global Small-Cap Opportunities Portfolio, a portfolio of AllianzGI Institutional Multi-Series Trust; AllianzGI Global Small-Cap Fund, a series of Allianz Funds; AllianzGI Global Water Fund, a series of Allianz Funds Multi-Strategy Trust; AllianzGI Health Sciences Fund, a series of Allianz Funds; AllianzGI Income & Growth Equity Fund, a series of Allianz Funds; AllianzGI International & Premium Strategy Fund; AllianzGI International Managed Volatility Fund, a series of Allianz Funds; AllianzGI Mid-Cap Fund, a series of Allianz Funds; AllianzGI Technology Fund, a series of Allianz Funds; NFJ Dividend, Interest & Premium Strategy Fund; AllianzGI NFJ Emerging Market Value Fund, a series of Allianz Funds Multi-Strategy Trust; AllianzGI Global Water Fund, a series of Allianz Funds Multi-Strategy Trust; AllianzGI NFJ International Small-Cap Value Fund; AllianzGI NFJ International Value Fund, a series of Allianz Funds; AllianzGI NFJ Mid-Cap Value Fund, a series of Allianz Funds; Nicholas-Applegate Emerging Markets Fund, n/k/a AllianzGI Emerging Markets Opportunities Fund, a series of Allianz Funds; Nicholas-Applegate Global Equity 130/30 Fund, a series of Allianz Funds Multi-Strategy Trust; Nicholas-Applegate Global Select Fund, a series of Allianz Funds; Nicholas-Applegate International Growth Fund, n/k/a AllianzGI International Growth Fund, a series of Allianz Funds Multi-Strategy Trust; Nicholas-Applegate Small Cap Emerging Countries Series LLC; AllianzGI NFJ Small-Cap Value Fund, a series of Allianz Funds; OpCap Mid Cap Portfolio, a series of Premier VIT; Allianz RCM Disciplined International Equity Fund, a series of Allianz Funds; RCM Global Equity Fund, a series of Allianz Funds; RCM Global Technology Fund, n/k/a AllianzGI Technology Fund, a series of Allianz Funds; RCM International Small Cap Fund, n/k/a AllianzGI International Small-Cap Fund, a series of Allianz Funds Multi-Strategy Trust; RCM Strategic Growth Fund, n/k/a AllianzGI Focused Growth Fund, a series of Allianz Funds; The Korea Fund, Inc.; Anchorage Capital Master Offshore LTD; Anchorage Capital Master Offshore LTD/ANCOFF-NYC; Anchorage Capital Partners, L.P.; Anchorage Crossover Credit Finance, LTD; Anchorage Crossover Credit Offshore Master Fund, LTD; Anchorage Illiquid Opportunities Offshore Master II, L.P.; Anchorage

Illiquid Opportunities Offshore Master III, L.P.;
 Anchorage Illiquid Opportunities Offshore Master IV,
 L.P.; Anchorage Illiquid Opportunities Offshore Master,
 L.P.; Anchorage MSW Structured Credit Master, L.P.;
 Anchorage Short Credit Offshore Master Fund, Ltd.; GRF
 Master Fund, L.P; PCI Fund LLC; Anchorage Short Credit
 Offshore Master Fund II, L.P.; GRF Master Fund II, L.P.;
 Active International Equity Fund - Jacket; Active
 International Equity Fund B - Jacket; Alpha Advantage
 1000 Fund B - Aggregate; Alpha Advantage 3000 Fund -
 Aggregate; Alpha Advantage 3000 Fund B - Aggregate;
 Alpha Advantage 500 Fund - Aggregate; Alpha Advantage
 500 Fund B - Aggregate; Alpha Advantage International
 Fund - Aggregate; Alpha Advantage Japan Fund; Alpha
 Advantage Japan Fund B; Alpha Advantage US Fund B -
 Aggregate; BlackRock Life Limited on behalf of Ascent
 Life Sovereign Screened Fund; BlackRock Collective
 Investment Funds on behalf of the unitholders in
 BlackRock Balanced Managed Fund; BlackRock Global
 Funds - Asean Leaders Fund; BlackRock Global Funds -
 Asia Pacific Equity Income Fund; BlackRock Global
 Funds -Asian Dragon Fund; BlackRock Global Funds -
 Asian Growth Leaders Fund; BlackRock Global Funds -
 Asian Local Bond Fund; BlackRock Global Funds - Asian
 Tiger Bond Fund; BlackRock Global Funds - China Bond
 Fund; BlackRock Global Funds - China Fund; BlackRock
 Global Funds - Continental European Flexible Fund;
 BlackRock Global Funds - Emerging Europe Fund ;
 BlackRock Global Funds - Emerging Markets Bond Fund;
 BlackRock Global Funds - Emerging Markets Corporate
 Bond Fund; BlackRock Global Funds - Emerging Markets
 Equity Income Fund; BlackRock Global Funds - Emerging
 Markets Fund; BlackRock Global Funds - Emerging
 Markets Investment Grade Bond Fund; BlackRock Global
 Funds - Emerging Markets Local Currency Bond Fund;
 BlackRock Global Funds - Euro Bond Fund ; BlackRock
 Global Funds - Euro Corporate Bond Fund; BlackRock
 Global Funds - Euro Short Duration Bond Fund;
 BlackRock Global Funds - Euro-Markets Fund;
 BlackRock Global Funds - European Equity Income Fund;
 BlackRock Global Funds - European Focus Fund;
 BlackRock Global Funds - European Fund; BlackRock
 Global Funds - European Special Situations Fund;
 BlackRock Global Funds - European Value Fund;
 BlackRock Global Funds - Fixed Income Global
 Opportunities Fund; BlackRock Global Funds - Flexible

Multi-Asset Fund; BlackRock Global Funds - Global Allocation Fund; BlackRock Global Funds - Global Corporate Bond Fund; BlackRock Global Funds - Global Dynamic Equity Fund; BlackRock Global Funds - Global Enhanced Equity Yield Fund; BlackRock Global Funds - Global Equity Fund; BlackRock Global Funds - Global Equity Income Fund; BlackRock Global Funds - Global Government Bond Fund; BlackRock Global Funds - Global High Yield Bond Fund; BlackRock Global Funds - Global Inflation Linked Bond Fund; BlackRock Global Funds - Global Multi-Asset Income Fund; BlackRock Global Funds - Global Opportunities Fund; BlackRock Global Funds - India Fund; BlackRock Global Funds - Japan Flexible Equity Fund; BlackRock Global Funds - Japan Small & MidCap Opportunities Fund; BlackRock Global Funds - Latin American Fund; BlackRock Global Funds - Natural Resources Growth & Income Fund; BlackRock Global Funds - New Energy Fund; BlackRock Global Funds - North American Equity Income Fund; BlackRock Global Funds - Pacific Equity Fund; BlackRock Global Funds - Swiss Small & MidCap Opportunities Fund; BlackRock Global Funds - United Kingdom Fund; BlackRock Global Funds - US Dollar Bond Fund; BlackRock Global Funds - US Dollar High Yield Bond Fund; BlackRock Global Funds - US Dollar Short Duration Bond Fund; BlackRock Global Funds - US Growth Fund; BlackRock Global Funds - US Small & MidCap Opportunities Fund; BlackRock Global Funds - World Agriculture Fund; BlackRock Global Funds - World Bond Fund; BlackRock Global Funds - World Energy Fund; BlackRock Global Funds - World Financials Fund; BlackRock Global Funds - World Gold Fund; BlackRock Global Funds - World Healthscience Fund; BlackRock Global Funds - World Mining Fund; BlackRock Global Funds - World Technology Fund; BlackRock Global Investment Series - Emerging Markets Local Currency Bond Index Portfolio; BlackRock Global Investment Series - Global Equity Income Portfolio; BlackRock Global Investment Series - Income Strategies Portfolio; BlackRock Channel Islands on behalf of Dynamic Diversified Growth Fund, a sub-fund of BlackRock Institutional Jersey Funds; BlackRock Absolute Return Bond Fund; BlackRock Advantage Global Fund, Inc.; BlackRock Advantage International Fund; BlackRock Advantage Large Cap Growth Fund - Aggregate; BlackRock Advantage U.S. Total Market V.I.

Fund of BLK Variable Series Fund; BlackRock All-Cap Energy & Resources Portfolio; BlackRock Appreciation Strategy Fund, Ltd. - Aggregate; BlackRock Asian Dragon Fund, Inc.; BlackRock Balanced Capital Portfolio of BlackRock Series Fund, Inc.; BlackRock Balanced Growth Portfolio Fund; BlackRock Canada CorePlus Long Bond Fund; BlackRock Capital Appreciation Fund, Inc.; BlackRock Capital Appreciation Portfolio of BlackRock Series Fund, Inc.; BlackRock Capital Appreciation V.I. Fund of BlackRock Variable Series Fund; BlackRock Capital Investment Corp. - AGG; BlackRock CDN MSCI EAFE Equity Index Class D; BlackRock CDN MSCI EAFE Equity Index Fund; BlackRock CDN MSCI EAFE Index Hedged Fund; BlackRock CDN Russell 3000 Index Hedged Non-Taxable Fund; BlackRock CDN US Equity Index Non-Taxable Class A; BlackRock Commodity Strategies Fund - Aggregate; BlackRock Continental European Fund; BlackRock Continental European Income Fund; BlackRock Core Bond Portfolio; BlackRock Core Bond Trust - Aggregate; BlackRock Asset Management Ireland Limited on behalf of the unitholders in Blackrock Core Plus Global Corporate Bond Fund, a sub-fund of BlackRock Active Selection Fund; BlackRock Corporate Bond Fund; BlackRock Corporate High Yield Fund, Inc.; BlackRock Credit Allocation Income Trust; BlackRock Credit Strategies Income Fund - Aggregate; BlackRock Debt Strategies Fund, Inc.; BlackRock Defined Opportunity Credit Trust; BlackRock Dynamic Diversified Growth Fund; BlackRock Emerging Markets Dividend Fund; BlackRock Emerging Markets Flexible Dynamic Bond Portfolio; BlackRock Emerging Markets Fund; BlackRock Emerging Markets Fund, Inc.; BlackRock Energy & Resources Portfolio; BlackRock Energy and Resources Trust; BlackRock Enhanced Capital and Income Fund, Inc.; BlackRock Enhanced Equity Dividend Trust; BlackRock Enhanced Global Dividend Trust; BlackRock Enhanced Government Fund, Inc.; BlackRock Enhanced International Dividend Trust -Aggregate; BlackRock Equity Dividend Fund; BlackRock Equity Dividend V.I. Fund of BLK Variable Series Fund; BlackRock EuroFund; BlackRock European Absolute Alpha Fund; BlackRock European Dynamic Fund; BlackRock Fixed Income Global Opportunities Fund; BlackRock Floating Rate Income Portfolio; BlackRock Floating Rate Income Strategies Fund, Inc.; BlackRock Floating Rate Income Trust; BlackRock Frontier Markets Fund - Jacket;

BlackRock Funds II, High Yield Bond Portfolio;
 BlackRock Funds II, Inflation Protected Bond Portfolio -
 Aggregate; BlackRock Asset Management Ireland Limited
 on behalf of the unitholders in BlackRock Global
 Aggregate ex-Japan Fund, a sub-fund of BlackRock Active
 Selection Fund; BlackRock Global Allocation Collective
 Fund; BlackRock Global Allocation Fund (Aust);
 BlackRock Global Allocation Fund, Inc; BlackRock
 Global Allocation Portfolio (Ins - Series); BlackRock
 Global Allocation Variable Series (V.I.) Fund (Ins - Var
 Ser); BlackRock Global Dividend Portfolio; BlackRock
 Global Equity Fund; BlackRock Global Income Fund;
 BlackRock Global Long/Short Credit Fund - Aggregate;
 BlackRock Global Long/Short Equity Fund; BlackRock
 Global Market Insight Fund B - Jacket; BlackRock Global
 Multi Asset Income Fund; BlackRock Global
 Opportunities V.I. Fund of BlackRock Variable Series
 Fund; BlackRock Global Small Cap Fund - NB This fund
 has been deregistered; BlackRock Gold & General Fund -
 Natural Resources; BlackRock Growth & Recovery Fund;
 BlackRock Health Sciences Master Unit Trust; BlackRock
 Health Sciences Opportunities Portfolio; BlackRock
 Health Sciences Trust; BlackRock Hedged Global Small
 Cap Fund - NB This fund has been deregistered;
 BlackRock High Equity Income Fund; BlackRock High
 Yield Portfolio of BlackRock Series Fund, Inc; BlackRock
 High Yield V.I. Fund; BlackRock International Dividend
 Fund; BlackRock International Equity Fund; BlackRock
 International Equity Fund; BlackRock International Fund;
 BlackRock International Gold Fund; BlackRock
 International V.I. Fund of BLK Variable Series Fund;
 BlackRock Korea Emerging Europe Fund - Master;
 BlackRock Korea Latin American Fund - Master;
 BlackRock Korea World Energy Fund - Master;
 BlackRock Korea World Gold Fund - Master; BlackRock
 Korea World Mining Fund - Master; BlackRock Latin
 America Fund, Inc.; BlackRock LBG DC 'A' Fund;
 BlackRock Limited Duration Income Trust - Aggregate;
 BlackRock Long-Horizon Equity Fund; BlackRock Low
 Duration Bond Portfolio - Aggregate; BlackRock Managed
 Income Fund; BlackRock Non-UCITS Retail Funds, on
 behalf of the unitholders in Blackrock Managed Volatility
 Fund; BlackRock Non-UCITS Retail Funds, on behalf of
 the unitholders in BlackRock Managed Volatility Fund I;
 BlackRock Non-UCITS Retail Funds, on behalf of the
 unitholders in BlackRock Managed Volatility Fund II;

BlackRock Non-UCITS Retail Funds, on behalf of the unitholders in BlackRock Managed Volatility Fund III; BlackRock Managed Volatility V.I. Fund of BlackRock Variable Series Fund; BlackRock Asset Management Ireland Limited on behalf of the unitholders in BlackRock Market Advantage Strategy Fund, a sub-fund of BlackRock Index Selection Fund; BlackRock Mid Cap Dividend Fund of BlackRock Mid Cap Dividend Series, Inc.; BlackRock Mid-Cap Growth Equity Portfolio; BlackRock Monthly Income Fund; BlackRock MSCI ACWI Minimum Volatility Index Fund; BlackRock MSCI Canada Small Cap Equity Index Fund; BlackRock MSCI Canada Small Cap Equity Index Non-Lendable Fund; BlackRock MSCI EAFE Equity Index Non-Lendable Fund; BlackRock MSCI EAFE Equity Index Non-Lendable Fund F; BlackRock MSCI EAFE Equity Index RSL Fund; BlackRock MSCI EAFE Small Cap Equity Index Fund; BlackRock MSCI EAFE Small Cap Equity Index Non-Lendable Fund; BlackRock MSCI Equity Index Fund B - Morocco; BlackRock MSCI Equity Index Non-Lendable Fund - Canada; BlackRock MSCI World ex USA Minimum Volatility Index Fund; BlackRock Multi-Asset Income Portfolio of BlackRock Funds II; BlackRock Multi-Sector Income Trust - Aggregate; BlackRock Natural Resources Growth & Income Fund; BlackRock Natural Resources Trust; BlackRock Overseas Fund; BlackRock Resources and Commodities Strategy Trust - Aggregate; BlackRock Scientific Hedged International Equity Fund; BlackRock Scientific International Equity Fund; BlackRock Strategic Global Bond Fund, Inc. - Aggregate; BlackRock Strategic Income Opportunities Portfolio; BlackRock Tactical Growth Fund; BlackRock Tactical Opportunities Fund; BlackRock Technology Opportunities Fund; BlackRock Total Factor Fund; BlackRock Total Return Portfolio of BlackRock Series Fund, Inc.; BlackRock Total Return V.I. Fund (Ins - Var Ser); BlackRock U.S. Government Bond Portfolio of BlackRock Funds II; BlackRock UK Absolute Alpha Fund; BlackRock UK Dynamic Fund; BlackRock UK Emerging Companies Hedge Fund; BlackRock UK Equity Fund; BlackRock UK Focus Fund; BlackRock UK Fund; BlackRock UK Income Fund; BlackRock UK Smaller Companies Fund; BlackRock UK Special Situations Fund; BlackRock UK Specialist Fund; BlackRock US Dynamic Fund; BlackRock US Opportunities Fund; BlackRock Utilities, Infrastructure & Power Opportunities Trust;

BlackRock Yen LIBOR Fund; BLK Global Market Insight Fund; BlackRock Strategic Funds - BlackRock Asia Extension Fund; BlackRock Strategic Funds - BlackRock European Absolute Return Fund; BlackRock Strategic Funds - BlackRock European Opportunities Extension Fund; BlackRock Strategic Funds - BlackRock Fixed Income Strategies Fund; BlackRock Strategic Funds - BlackRock Global Absolute Return Bond Fund; BlackRock Strategic Funds - BlackRock Americas Diversified Equity Absolute Return Fund; BlackRock Strategic Funds - BlackRock Dynamic Diversified Growth Fund; BlackRock Strategic Funds - BlackRock Emerging Markets Absolute Return Fund; BlackRock Strategic Funds - BlackRock Emerging Markets Allocation Fund; BlackRock Strategic Funds - BlackRock European Credit Strategies Fund; BlackRock Strategic Funds - BlackRock European Diversified Equity Absolute Return Fund; BlackRock Strategic Funds - Emerging Markets Flexi Dynamic Bond Fund; BlackRock Strategic Funds - European Constrained Credit Strategies Fund ; Cadbury Hedge Fund Alternatives Portfolio - Aggregate; Canada Alpha Tilts Fund; Canada Alpha Tilts Fund B; Canada Equity Index ESG Screened Fund B; Canada Market Neutral Fund B - Aggregate; CoreAlpha Bond Fund E; CoreAlpha Bond Master Portfolio; CorePlus Bond Fund B; Currency Selection Developed Markets AGG; Currency Selection Emerging Markets AGG; Developed ex-U.S. Real Estate Index Non-Lendable Fund; Developed ex-US Real Estate Index Fund; Developed ex-US Real Estate Index Fund B; Developed Markets Bond Index Mother Fund; Developed Real Estate Index Non-Lendable Fund; EAFE Currency Hedged Equity Index Fund; EAFE Equity Growth Index Fund; EAFE Equity Index Fund E; EAFE Equity Index Fund F; EAFE Equity Index Fund P; EAFE Equity Value Index Fund; EAFE Sudan Free Equity Index Fund; Emerging Markets Alpha Fund B - Jacket; Emerging Markets Alpha Master Fund Ltd.; Emerging Markets Alpha Tilts Fund (Jacket); Emerging Markets Alpha Tilts Fund B (Jacket); Emerging Markets Equity Index ESG Screened Fund B; Emerging Markets Equity Index Master Fund; Emerging Markets Equity Index Plus Fund; Emerging Markets Index Non-Lendable Fund; Emerging Markets Index Non-Lendable Fund B; Emerging Markets Local Bond Index Fund B; Emerging Markets Opportunities LR Fund - Aggregate; Emerging Markets Opportunities MR Fund - Aggregate; Emerging Markets

Opportunities MR Fund B - Aggregate; Emerging Markets Small Capitalization Equity Index Fund; Emerging Markets Small Capitalization Equity Index Non-Lendable Fund; Emerging Markets Small Capitalization Equity Index Non-Lendable Fund B; Emerging Markets Strategic Insights Non-Lendable Fund; Emerging Markets Strategic Insights Non-Lendable Fund B; Emerging Markets Sudan Free Equity Index Fund; Equity Dividend (Active Stock Sleeve); Equity Dividend Fund; Europe Alpha Tilts Fund; Europe Alpha Tilts Non-Lendable Fund B; Europe Equity Index ESG Screened Fund B; Europe Ex-UK Alpha Tilts ESG Screened Fund B; Fixed Income GlobalAlpha Master Fund Ltd.; Frontier Markets ESG Screened Fund B - Jacket; Frontier Markets ex-Gulf Cooperation Council Countries ESG Screened Fund B; FTSE RAFI Emerging Index Non-Lendable Fund; Fundamental Large Cap Growth (Active Stock Sleeve); GAL ACM HSBC; GAL ACM RBS; GAL ACM UBS; GAL ECM RBS; GAL HSBC FX; GAL SCM RBS; GAL UBS FX; Global Aggregate ex-USD Bond Index Fund B; Global Aggregate ex-USD Currency Hedged Index Non-Lendable Fund; Global Alpha Tilts Fund B; Global Ascent (Sterling) Ltd.; Global Dividend Income Fund; Global Dividend Income Fund B; Global Equity Focus Fund B; Global Equity Mandate Fund B; Global Ex-US Alpha Tilts Fund; Global High Yield Bond Index Fund B; Global Market Neutral Fund B; Global Multi-cap Equity Fund B; Global Treasury ex-U.S. Screened USD Hedged Fund E; Gold Fund; Gold Metal Open Mother Fund; i-mizuho Developed Markets Inflation Linked Bond Index; India Equity Fund Aggregate; International Active Stock Currency Hedged Fund; International Alpha Tilts Fund; International Alpha Tilts Fund B; International Alpha Tilts RSL Fund; International Equity Index Plus Fund Jacket; International Equity Index Plus Fund B - Jacket; International Multi-cap Equity Fund; International Sudan Divestment Index Fund; International Tilts Hedged CAD Fund B; International Tilts Master Portfolio; BlackRock Asset Management Deutschland AG on behalf of iShares EST Health Care (DE); iShares Plc on behalf of iShares \$ Corp Bond UCITS; iShares II Plc on behalf of iShares \$ High Yield Corp Bond UCITS; iShares Plc on behalf of iShares \$ Treasury Bond 1-3yr UCITS; BlackRock Collective Investment Funds, on behalf of the unitholders in iShares 100 UK Equity Index Fund (UK); iShares 1-3 Year International Treasury Bond ETF; iShares 1-5 Year

Laddered Corporate Bond Index Fund; BlackRock Collective Investment Funds, on behalf of the unitholders in iShares 350 UK Equity Index Fund (UK); iShares Plc on behalf of iShares AEX UCITS ETF EUR (Dist); iShares V Plc on behalf of iShares Agribusiness UCITS ETF USD (Acc); iShares Alternatives Completion Portfolio Builder Fund; iShares Asia 50 ETF; iShares Asia Developed Real Estate ETF; iShares Plc on behalf of iShares Asia Pacific Dividend UCITS ETF USD (Dist); iShares II Plc on behalf of iShares Asia Property Yield UCITS ETF USD (Dist); iShares Asia/Pacific Dividend ETF; iShares II Plc on behalf of iShares BRIC 50 UCITS ETF USD (Dist); iShares BRIC Index Fund; iShares Canadian Fundamental Index Fund; iShares Canadian Growth Index ETF; iShares China All-Cap Index Fund; iShares China Index ETF; iShares Plc on behalf of iShares China Large Cap UCITS ETF USD (Dist); iShares China Large-Cap ETF; iShares Conservative Core Portfolio Builder Fund; iShares Conservative Core Portfolio Builder Fund; BlackRock Collective Investment Funds, on behalf of the unitholders in iShares Continental European Equity Index Fund (UK); iShares Core Euro Corp Bond UCITS Common Pool; iShares Core Euro Govt Bond UCITS ETF EUR (Dist); iShares Plc on behalf of iShares Core FTSE 100 UCITS; iShares Core GBP Corp Bond UCITS ETF GBP (Dist); iShares Core MSCI AC Asia ex Japan Index ETF; iShares Core MSCI EAFE ETF; iShares Core MSCI EAFE IMI Index ETF; iShares Core MSCI Emerging Markets ETF; iShares Core MSCI Emerging Markets IMI Index ETF; iShares III Plc on behalf of iShares Core MSCI Japan IMI UCITS ETF USD (Acc); iShares Core MSCI Total International Stock ETF; iShares III Plc on behalf of iShares Core MSCI World UCITS; iShares Core S&P 500 Index ETF; iShares Core S&P 500 Index ETF (CAD-Hedged); iShares Core S&P/TSX Capped Composite Index ETF; iShares Core S&P/TSX Composite High Dividend Index ETF; iShares II Plc on behalf of iShares Developed Markets Property Yield UCITS; iShares III Plc on behalf of iShares Developed World ex-UK UCITS ETF; BlackRock Asset Management Deutschland AG on behalf of iShares Dow Jones Asia Pacific Select Dividend 30 UCITS ETF (DE); iShares Dow Jones Canada Select Value Index Fund; BlackRock Asset Management Deutschland AG on behalf of iShares Dow Jones China Offshore 50 UCITS ETF (DE); iShares II Plc on behalf of iShares Dow Jones Global Sustainability Screened UCITS

ETF USD (Acc); BlackRock Asset Management Deutschland AG on behalf of iShares Dow Jones Global Titans 50 UCITS ETF (DE); BlackRock Asset Management Deutschland AG on behalf of iShares Dow Jones Industrial Average UCITS ETF (DE); BlackRock Asset Management Deutschland AG on behalf of iShares Dow Jones U.S. Select Dividend UCITS ETF (DE); iShares Edge MSCI EM Minimum Volatility UCITS ETF USD (Acc); iShares Edge MSCI Europe Minimum Volatility UCITS Common Pool; iShares Edge MSCI Min Vol Canada Index ETF; iShares Edge MSCI Min Vol EAFE ETF; iShares Edge MSCI Min Vol EAFE Index ETF; iShares Edge MSCI Min Vol EAFE Index ETF; iShares Edge MSCI Min Vol Emerging Markets ETF; iShares Edge MSCI Min Vol Emerging Markets Index ETF; iShares Edge MSCI Min Vol Global ETF; iShares Edge MSCI Min Vol Global Index ETF; iShares Edge MSCI Min Vol USA Index ETF; iShares VI Plc on behalf of iShares Edge MSCI World Minimum Volatility UCITS; iShares V on behalf of iShares EM Dividend UCITS ETF USD (Dist); iShares EM Infrastructure UCITS ETF USD (Dist); iShares Emerging Asia Local Govt Bond UCITS ETF USD (Dist); iShares Emerging Markets Dividend ETF; BlackRock Global Index Funds - iShares Emerging Markets Equity Index Fund (LU); BlackRock Collective Investment Funds on behalf of the unitholders in iShares Emerging Markets Equity Index Fund (UK); iShares Emerging Markets Fundamental Index ETF; BlackRock Global Index Funds - iShares Emerging Markets Government Bond Index Fund (LU); iShares Emerging Markets Infrastructure ETF; iShares III Plc on behalf of iShares EUR Covered Bond UCITS ETF; iShares II Plc on behalf of iShares EUR Govt Bond 15-30yr UCITS ETF; iShares II Plc on behalf of iShares EUR Govt Bond 7-10yr UCITS ETF; iShares Plc on behalf of iShares EUR Inflation Linked Govt Bond UCITS ETF; iShares III Plc on behalf of iShares Euro Aggregate Bond UCITS ETF EUR (Dist); iShares III Plc on behalf of iShares Euro Corp Bond 1-5yr UCITS ETF EUR (Dist); iShares III Plc on behalf of iShares Euro Corp Bond ex-Financials 1-5yr UCITS ETF EUR (Dist); iShares III Plc on behalf of iShares Euro Corp Bond ex-Financials UCITS ETF EUR (Dist); iShares Plc on behalf of iShares Euro Corp Bond Large Cap UCITS ETF EUR (Dist); iShares Plc on behalf of iShares Euro Dividend UCITS ETF EUR (Dist); iShares III Plc on behalf of iShares Euro Govt Bond 10-15yr

UCITS ETF EUR (Dist); iShares Plc on behalf of iShares Euro Govt Bond 1-3yr UCITS ETF EUR (Dist); iShares II Plc on behalf of iShares Euro Govt Bond 3-5yr UCITS ETF EUR (Dist); iShares III Plc on behalf of iShares Euro Govt Bond 5-7yr UCITS ETF EUR (Dist); iShares Plc on behalf of iShares Euro High Yield Corp Bond UCITS; iShares II Plc on behalf of iShares EURO STOXX 50 UCITS ETF (Acc); iShares III Plc on behalf of iShares EURO STOXX 50 UCITS ETF EUR (Dist); iShares Plc on behalf of iShares EURO STOXX Mid UCITS ETF EUR (Dist); iShares Plc on behalf of iShares EURO STOXX Small UCITS ETF EUR (Dist); BlackRock Asset Management Deutschland AG on behalf of iShares EURO STOXX UCITS ETF (DE); iShares Plc on behalf of iShares Euro Total Market Growth Large UCITS ETF EUR (Dist); iShares Plc on behalf of iShares Euro Total Market Value Large UCITS ETF EUR (Dist); iShares Europe Developed Real Estate ETF; BlackRock Global Index Funds - iShares Europe Equity Index Fund (LU); iShares Europe ETF; iShares Plc on behalf of iShares European Property Yield UCITS ETF EUR (Dist); BlackRock Asset Management Deutschland AG on behalf of iShares FTSE 100 UCITS ETF (DE); iShares Plc on behalf of iShares FTSE 250 UCITS ETF GBP (Dist); iShares FTSE China ETF; iShares II Plc on behalf of iShares FTSE MIB UCITS ETF EUR (Dist); iShares Plc on behalf of iShares FTSEurofirst 100 UCITS ETF EUR (Dist); iShares Plc on behalf of iShares FTSEurofirst 80 UCITS ETF EUR (Dist); iShares Global 100 ETF; iShares Global AAA-AA Govt Bond UCITS ETF USD (Dist); iShares Global Agriculture Index Fund; iShares Global Agriculture Index Fund; iShares Global Clean Energy ETF; iShares Global Clean Energy UCITS ETF USD (Dist); iShares Global Completion Portfolio Builder Fund; iShares Global Completion Portfolio Builder Fund; iShares Global Consumer Discretionary ETF; iShares Global Consumer Staples ETF; iShares Global Corp Bond EUR Hedged UCITS ETF (Dist); iShares Global Corp Bond UCITS Common Pool; iShares Global Energy ETF; iShares Global Financials ETF; BlackRock Global Index Funds - iShares Global Government Bond Index Fund (LU); iShares Global Govt Bond UCITS Common Pool; iShares Global Healthcare ETF; iShares Global Healthcare Index ETF (CAD-Hedged); iShares VI on behalf of iShares Global High Yield Corp Bond GBP Hedged UCITS ETF (Dist); iShares Plc on behalf of iShares

Global High Yield Corp Bond UCITS; iShares Global Industrials ETF; iShares Global Inflation Linked Govt Bond UCITS ETF Common Pool; iShares Global Inflation-Linked Bond ETF; BlackRock Fixed Income Dublin Funds Plc on behalf of iShares Global Inflation-Linked Bond Index Fund (US Dollar Hedged) (IE); iShares Global Infrastructure ETF; iShares Global Infrastructure Index Fund; iShares Global Infrastructure UCITS ETF USD (Dist); iShares Global Materials ETF; iShares Global Monthly Dividend Index ETF (CAD-Hedged) AGG; iShares Global Nuclear Energy ETF; BlackRock Collective Investment Funds on behalf of the unitholders in iShares Global Property Securities Equity Index Fund (UK); iShares Global Real Estate Index ETF; iShares Global Tech ETF; iShares Global Telecom ETF; iShares Global Timber & Forestry ETF; iShares Global Timber & Forestry UCITS ETF USD (Dist); iShares Global Utilities ETF; iShares Global Water Index ETF; iShares Global Water UCITS ETF USD (Dist); iShares Gold Bullion ETF; iShares Gold Bullion ETF; iShares Gold Producers UCITS ETF USD (Acc); iShares Growth Core Portfolio Builder Fund; iShares Growth Core Portfolio Builder Fund; iShares Hong Kong Equity Index Fund; iShares India Index ETF; iShares India Index ETF; iShares INMEX Total Return TRAC; iShares International Developed Property ETF; iShares International Developed Real Estate ETF; iShares International Fundamental Index Fund; iShares International High Yield Bond ETF; iShares International Inflation-Linked Bond ETF; iShares International Preferred Stock ETF; iShares International Select Dividend ETF; iShares International Treasury Bond ETF; iShares IPC CompMX Total Return Trac; iShares IPC Large Cap Total Return Trac; iShares J.P. Morgan \$ EM Bond UCITS Common Pool; iShares J.P. Morgan EM Local Currency Bond ETF; iShares III Plc on behalf of iShares J.P. Morgan EM Local Govt Bond UCITS ETF USD (Dist); iShares J.P. Morgan USD EM Bond EUR Hedged UCITS ETF (Dist); iShares J.P. Morgan USD Emerging Markets Bond Index Fund (CAD-Hedged); iShares J.P. Morgan USD Emerging Markets Bond Index Fund (CAD-Hedged); iShares Jantzi Social Index Fund; iShares Jantzi Social Index Fund; BlackRock Global Index Funds - iShares Japan Equity Index Fund (LU); BlackRock Collective Investment Funds, on behalf of iShares Japan Equity Index Fund (UK); iShares Japan Fundamental Index Fund (CAD-Hedged); iShares Japan Fundamental

Index Fund (CAD-Hedged); iShares JPX-Nikkei 400 ETF; iShares Latin America 40 ETF; iShares Listed Private Equity UCITS ETF USD (Dist) AGG; iShares II Plc on behalf of iShares MSCI AC Far East ex-Japan Small Cap UCITS ETF USD (Dist); iShares Plc on behalf of iShares MSCI AC Far East ex-Japan UCITS ETF USD (Dist); iShares MSCI ACWI ETF; iShares MSCI ACWI ex U.S. Consumer Discretionary ETF; iShares MSCI ACWI ex U.S. Consumer Staples ETF; iShares MSCI ACWI ex U.S. Energy ETF; iShares MSCI ACWI ex U.S. ETF; iShares MSCI ACWI ex U.S. Financials ETF; iShares MSCI ACWI ex U.S. Healthcare ETF; iShares MSCI ACWI ex U.S. Industrials ETF; iShares MSCI ACWI ex U.S. Information Technology ETF; iShares MSCI ACWI ex U.S. Materials ETF; iShares MSCI ACWI ex U.S. Telecommunication Services ETF; iShares MSCI ACWI ex U.S. Utilities ETF; iShares V Plc on behalf of iShares MSCI ACWI UCITS ETF USD (Acc); iShares MSCI All Country Asia ex Japan ETF; iShares MSCI All Country Asia ex Japan Small-Cap ETF; iShares MSCI All Country Asia Information Technology ETF; iShares MSCI All Peru ETF; iShares MSCI Asia APEX Mid Cap Index ETF; iShares MSCI Asia APEX Small Cap Index ETF; iShares MSCI Australia ETF; iShares MSCI Australia Small-Cap ETF; iShares III Plc on behalf of iShares MSCI Australia UCITS ETF USD (Acc); iShares MSCI Austria ETF; iShares MSCI Belgium ETF; iShares MSCI Brazil ETF; iShares MSCI Brazil Index Fund; iShares MSCI Brazil Small-Cap ETF; iShares Plc on behalf of iShares MSCI Brazil UCITS ETF USD (Dist); iShares MSCI BRIC ETF; iShares MSCI Canada ETF; iShares MSCI Canada Small-Cap ETF; iShares VII Plc on behalf of iShares MSCI Canada UCITS ETF USD (Acc); iShares MSCI China ETF; iShares MSCI China Small-Cap ETF; iShares MSCI Colombia ETF; iShares MSCI Denmark ETF; iShares MSCI EAFE ETF; iShares MSCI EAFE Growth ETF; iShares MSCI EAFE Index Fund (CAD-Hedged); iShares MSCI EAFE Index Fund (CAD-Hedged); iShares MSCI EAFE International Index Fund; iShares MSCI EAFE Small-Cap ETF; iShares MSCI EAFE Value ETF; iShares Plc on behalf of iShares MSCI Eastern Europe Capped UCITS ETF USD (Dist); iShares VII Plc on behalf of iShares MSCI EM Asia UCITS ETF USD (Acc); iShares MSCI EM Islamic UCITS ETF USD (Dist); iShares MSCI EM Latin America UCITS ETF USD (Dist); iShares MSCI EM Small Cap UCITS ETF

USD (Dist); iShares MSCI EM UCITS ETF USD (Acc); iShares MSCI EM UCITS ETF USD (Dist); iShares MSCI Emerging Markets Asia ETF; iShares MSCI Emerging Markets Consumer Discretionary ETF; iShares MSCI Emerging Markets Eastern Europe ETF; iShares MSCI Emerging Markets EMEA ETF; iShares MSCI Emerging Markets Energy Capped ETF; iShares MSCI Emerging Markets ETF; iShares MSCI Emerging Markets Financials ETF; iShares MSCI Emerging Markets Growth ETF; iShares MSCI Emerging Markets Index ETF; iShares MSCI Emerging Markets Latin America ETF; iShares MSCI Emerging Markets Materials ETF; iShares MSCI Emerging Markets Small-Cap ETF; iShares MSCI Emerging Markets Value ETF; iShares III Plc on behalf of iShares MSCI Europe ex-EMU UCITS ETF; iShares Plc on behalf of iShares MSCI Europe ex-UK UCITS ETF EUR (Dist); iShares MSCI Europe Financials ETF; iShares MSCI Europe Small-Cap ETF; iShares II Plc on behalf of iShares MSCI Europe SRI UCITS ETF EUR (Acc); iShares III Plc on behalf of iShares MSCI Europe UCITS ETF EUR (Acc); iShares II Plc on behalf of iShares MSCI Europe UCITS ETF EUR (Dist); iShares MSCI Eurozone ETF; iShares MSCI Far East Financials ETF; iShares MSCI Finland ETF; iShares MSCI France ETF; iShares MSCI Frontier 100 ETF; iShares MSCI GCC ex-Saudi Arabia UCITS ETF USD (Dist); iShares MSCI Germany ETF; iShares MSCI Germany Small-Cap ETF; iShares MSCI Global Agriculture Producers ETF; iShares MSCI Global Energy Producers ETF; iShares MSCI Global Gold Miners ETF; iShares MSCI Global Metals & Mining Producers ETF; iShares MSCI Global Silver Miners ETF; iShares MSCI Hong Kong ETF; iShares MSCI Hong Kong Small-Cap ETF; iShares MSCI Indonesia ETF; iShares MSCI Ireland ETF; iShares MSCI Israel ETF; iShares MSCI Italy ETF; iShares MSCI Japan CHF Hedged UCITS ETF (Acc) Agg; iShares MSCI Japan ETF; iShares MSCI Japan EUR Hedged UCITS ETF (Acc); iShares MSCI Japan GBP Hedged UCITS ETF (Acc); iShares MSCI Japan Small Cap UCITS ETF USD (Dist); iShares MSCI Japan Small-Cap ETF; iShares Plc on behalf of iShares MSCI Japan UCITS ETF USD (Dist); iShares Plc on behalf of iShares MSCI Japan USD Hedged UCITS ETF (Acc) AGG; iShares MSCI Kokusai ETF; iShares Plc on behalf of iShares MSCI Korea UCITS ETF USD (Dist); iShares MSCI Malaysia ETF; iShares MSCI Mexico ETF; iShares MSCI Mexico IMI Capped UCITS ETF; iShares

MSCI Netherlands ETF; iShares MSCI New Zealand ETF; iShares MSCI North America UCITS ETF USD (Dist); iShares MSCI Norway ETF; iShares MSCI Pacific ex Japan ETF; iShares III Plc on behalf of iShares MSCI Pacific ex-Japan UCITS ETF USD (Dist); iShares MSCI Philippines ETF; iShares MSCI Poland ETF; iShares V Plc on behalf of iShares MSCI Poland UCITS ETF USD (Acc); iShares MSCI Singapore ETF; iShares MSCI Singapore Small-Cap ETF; iShares MSCI South Africa ETF; iShares III Plc on behalf of iShares MSCI South Africa UCITS ETF USD (Acc); iShares MSCI Spain ETF; iShares MSCI Sweden ETF; iShares MSCI Switzerland ETF; iShares MSCI Taiwan ETF; iShares MSCI Taiwan UCITS ETF USD (Dist); iShares MSCI Thailand ETF; iShares MSCI Turkey ETF; iShares MSCI Turkey UCITS ETF USD (Dist); iShares MSCI United Kingdom ETF; iShares MSCI United Kingdom Small-Cap ETF; iShares VI Plc on behalf of iShares MSCI World CHF Hedged UCITS ETF (Acc); iShares MSCI World ETF; iShares V Plc on behalf of iShares MSCI World EUR Hedged UCITS ETF (Acc); iShares V Plc on behalf of iShares MSCI World GBP Hedged UCITS ETF (Acc); iShares MSCI World Index Fund; iShares II Plc on behalf of iShares MSCI World Islamic UCITS ETF USD (Dist); iShares Plc on behalf of iShares MSCI World UCITS ETF USD (Dist); iShares NAFTRAC; iShares NASDAQ 100 Index Fund (CAD-Hedged); BlackRock Asset Management Deutschland AG on behalf of iShares NASDAQ-100 UCITS ETF (DE); BlackRock Asset Management Deutschland AG on behalf of iShares Nikkei 225 UCITS ETF (DE); BlackRock Global Index Funds - iShares North America Equity Index Fund (LU); iShares North America Real Estate ETF; BlackRock Collective Investment Funds on behalf of the unitholders in iShares North American Equity Index Fund (UK); iShares NYSE Composite ETF; iShares V Plc on behalf of iShares Oil & Gas Exploration & Production UCITS ETF USD (Acc); iShares Oil Sands Index Fund; BlackRock Collective Investment Funds on behalf of the unitholders in iShares Overseas Corporate Bond Index Fund (UK); BlackRock Collective Investment Funds on behalf of the unitholders in iShares Overseas Government Bond Index Fund (UK); BlackRock Global Index Funds - iShares Pacific ex Japan Equity Index Fund (LU); BlackRock Collective Investment Funds on behalf of the unitholders in iShares Pacific ex Japan Equity Index Fund (UK); iShares VI Plc

on behalf of iShares S&P 500 CHF Hedged UCITS ETF (Acc); iShares V Plc on behalf of iShares S&P 500 EUR Hedged UCITS ETF (Acc); iShares V Plc on behalf of iShares S&P 500 GBP Hedged UCITS ETF (Acc); iShares Plc on behalf of iShares S&P 500 UCITS ETF USD (Dist); iShares S&P Latin America 40 Index Fund; iShares III Plc on behalf of iShares S&P SmallCap 600 UCITS ETF USD (Dist); iShares S&P TSX Canadian Dividend Aristocrats Index Fund; iShares S&P TSX Global Mining Index Fund; iShares S&P US Dividend Growers Index Fund (CAD-Hedged); iShares S&P/TSX 60 Index Fund; iShares S&P/TSX Capped Energy Index Fund; iShares S&P/TSX Capped Information Technology Index Fund; iShares S&P/TSX Capped Materials Index Fund; iShares S&P/TSX Capped REIT Index Fund; iShares S&P/TSX Completion Index ETF; iShares S&P/TSX Global Base Metals Index Fund; iShares S&P/TSX Global Gold Index Fund; iShares S&P/TSX North American Preferred Stock Index Fund (CAD-Hedged); iShares S&P/TSX SmallCap Index Fund; iShares S&P/TSX Venture Index Fund; iShares Short Maturity Bond ETF; iShares Silver Bullion ETF; BlackRock Asset Management Deutschland AG on behalf of iShares SLI UCITS ETF (DE); BlackRock Asset Management Deutschland AG on behalf of iShares STOXX Asia Pacific 600 Real Estate Cap UCITS ETF (DE); BlackRock Asset Management Deutschland AG on behalf of iShares STOXX EU Enlarged 15 UCITS ETF (DE); BlackRock Asset Management Deutschland AG on behalf of iShares STOXX Europe 50 UCITS ETF (DE); iShares II Plc on behalf of iShares STOXX Europe 50 UCITS ETF EUR (Dist); BlackRock Asset Management Deutschland AG on behalf of iShares STOXX Europe 600 Automobiles & Parts UCITS ETF (DE), a sub-fund of iShares (DE) I Investmentaktiengesellschaft mit Teilgesellschaftsvermoege; BlackRock Asset Management Deutschland AG on behalf of iShares STOXX Europe 600 Banks UCITS ETF (DE), a sub-fund of iShares (DE) I Investmentaktiengesellschaft mit Teilgesellschaftsvermoege; BlackRock Asset Management Deutschland AG on behalf of iShares STOXX Europe 600 Basic Resources UCITS ETF (DE), a sub-fund of iShares (DE) I Investmentaktiengesellschaft mit Teilgesellschaftsvermoege; BlackRock Asset Management Deutschland AG on behalf of iShares STOXX Europe 600 Chemicals UCITS ETF (DE), a sub-fund of iShares (DE) I Investmentaktiengesellschaft mit

Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Construction & Materials UCITS
 ETF (DE), a sub-fund of iShares (DE) I
 Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Financial Services UCITS ETF (DE),
 a sub-fund of iShares (DE) I Investmentaktiengesellschaft
 mit Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Food & Beverage UCITS ETF (DE),
 a sub-fund of iShares (DE) I Investmentaktiengesellschaft
 mit Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Health Care UCITS ETF (DE), a sub-
 fund of iShares (DE) I Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Industrial Goods & Services UCITS
 ETF (DE), a sub-fund of iShares (DE) I
 Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Insurance UCITS ETF (DE), a sub-
 fund of iShares (DE) I Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Media UCITS ETF (DE), a sub-fund
 of iShares (DE) I Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Oil & Gas UCITS ETF (DE), a sub-
 fund of iShares (DE) I Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Personal & Household Goods UCITS
 ETF (DE), a sub-fund of iShares (DE) I
 Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Real Estate UCITS ETF (DE), a sub-
 fund of iShares (DE) I Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoegen; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Retail UCITS ETF (DE), a sub-fund

of iShares (DE) I Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoege; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Technology UCITS ETF (DE), a sub-
 fund of iShares (DE) I Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoege; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Telecommunications UCITS ETF
 (DE), a sub-fund of iShares (DE) I
 Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoege; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Travel & Leisure UCITS ETF (DE), a
 sub-fund of iShares (DE) I Investmentaktiengesellschaft
 mit Teilgesellschaftsvermoege; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 UCITS ETF (DE); BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe 600 Utilities UCITS ETF (DE), a sub-
 fund of iShares (DE) I Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoege; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX Europe Large 200 UCITS ETF (DE); BlackRock
 Asset Management Deutschland AG on behalf of iShares
 STOXX Europe Mid 200 UCITS ETF (DE); BlackRock
 Asset Management Deutschland AG on behalf of iShares
 STOXX Europe Select Dividend 30 UCITS ETF (DE);
 BlackRock Asset Management Deutschland AG on behalf
 of iShares STOXX Europe Small 200 UCITS ETF (DE);
 BlackRock Asset Management Deutschland AG on behalf
 of iShares STOXX Global Select Dividend 100 UCITS
 ETF (DE) a sub-fund of iShares (DE) I
 Investmentaktiengesellschaft mit
 Teilgesellschaftsvermoege; BlackRock Asset
 Management Deutschland AG on behalf of iShares
 STOXX North America 600 Real Estate Cap UCITS ETF
 (DE); BlackRock Asset Management Deutschland AG on
 behalf of iShares TecDAX UCITS ETF (DE); iShares U.S.
 High Dividend Equity Index ETF (CAD-Hedged); iShares
 U.S. High Yield Bond Index ETF (CAD-Hedged); iShares
 U.S. IG Corporate Bond Index Fund (CAD-Hedged);
 iShares U.S. Small Cap Index ETF (CAD-Hedged);
 BlackRock Collective Investment Funds on behalf of the
 unit-holders in iShares UK Equity Index Fund (UK);
 iShares US & Intl High Yield Corp Bond ETF; iShares II
 Plc on behalf of iShares US Aggregate Bond UCITS;

BlackRock Collective Investment Funds on behalf of the unitholders in iShares US Equity Index Fund (UK); iShares US Fundamental Index ETF; iShares II Plc on behalf of iShares USD Treasury Bond 7-10yr UCITS ETF; BlackRock Global Index Funds - iShares World Equity Index Fund (LU); Japan Alpha Tilts Fd B; Japan Alpha Tilts Fund; Japan Alpha Tilts Fund L; Japan Alpha Tilts Fund O; Japan Equity Index ESG Screened Fund B; Large Cap Active Stock Trading Fund; LifePath 2010 Master Portfolio; LifePath Dynamic 2020 Portfolio - Aggregate; LifePath Dynamic 2030 Portfolio - Aggregate; LifePath Dynamic 2040 Portfolio - Aggregate; LifePath Dynamic Retirement Portfolio - Aggregate; Long Duration Alpha Plus Bond Fund; Long Duration AlphaCredit Plus Bond Fund; Market Advantage Collective Non-Lendable Fund; Market Advantage, Ltd.; Master Total Return Portfolio of Master Bond LLC - Aggregate; Master Total Return Portfolio of Master Bond LLC - Aggregate; MSCI Canada Small Cap Equity Index Fund B; MSCI EAFE Equity Index Non-Lendable Fund B; MSCI EAFE Small Cap Equity Index Fund B; MSCI EMU IMI Index Fund B; MSCI Eq Index Fd B-Argentina; MSCI Eq Index Fd B-India; MSCI Eq Index Fd B-S Korea; MSCI Eq Index Fd B-Taiwan; MSCI Eq Index Fd-Malaysia; MSCI Equity Index Fund - Australia; MSCI Equity Index Fund - Austria; MSCI Equity Index Fund - Belgium; MSCI Equity Index Fund - Canada; MSCI Equity Index Fund - Denmark; MSCI Equity Index Fund - Finland; MSCI Equity Index Fund - France; MSCI Equity Index Fund - Germany; MSCI Equity Index Fund - Greece; MSCI Equity Index Fund - Hong Kong; MSCI Equity Index Fund - Ireland; MSCI Equity Index Fund - Italy; MSCI Equity Index Fund - Japan; MSCI Equity Index Fund - Mexico; MSCI Equity Index Fund - Netherlands; MSCI Equity Index Fund - New Zealand; MSCI Equity Index Fund - Norway; MSCI Equity Index Fund - Portugal; MSCI Equity Index Fund - Singapore; MSCI Equity Index Fund - Spain; MSCI Equity Index Fund - Sweden; MSCI Equity Index Fund - Switzerland; MSCI Equity Index Fund - Turkey; MSCI Equity Index Fund - United Kingdom; MSCI Equity Index Fund B - Austria; MSCI Equity Index Fund B - Belgium; MSCI Equity Index Fund B - Brazil; MSCI Equity Index Fund B - Canada; MSCI Equity Index Fund B - Chile; MSCI Equity Index Fund B - China; MSCI Equity Index Fund B - Colombia; MSCI Equity Index Fund B - Czech Republic; MSCI Equity

Index Fund B - Denmark; MSCI Equity Index Fund B - Egypt; MSCI Equity Index Fund B - Finland; MSCI Equity Index Fund B - France; MSCI Equity Index Fund B - Germany; MSCI Equity Index Fund B - Greece; MSCI Equity Index Fund B - Hong Kong; MSCI Equity Index Fund B - Hungary; MSCI Equity Index Fund B - Indonesia; MSCI Equity Index Fund B - Ireland; MSCI Equity Index Fund B - Israel; MSCI Equity Index Fund B - Italy; MSCI Equity Index Fund B - Japan; MSCI Equity Index Fund B - Malaysia; MSCI Equity Index Fund B - Mexico; MSCI Equity Index Fund B - Netherlands; MSCI Equity Index Fund B - New Zealand; MSCI Equity Index Fund B - Norway; MSCI Equity Index Fund B - Peru; MSCI Equity Index Fund B - Philippines; MSCI Equity Index Fund B - Poland; MSCI Equity Index Fund B - Portugal; MSCI Equity Index Fund B - Russia; MSCI Equity Index Fund B - Singapore; MSCI Equity Index Fund B - South Africa; MSCI Equity Index Fund B - Spain; MSCI Equity Index Fund B - Sweden; MSCI Equity Index Fund B - Switzerland; MSCI Equity Index Fund B - Thailand; MSCI Equity Index Fund B - Turkey; MSCI Equity Index Fund B - United Kingdom; MSCI Equity Index Fund B-Australia; MSCI Equity Index Non-Lendable Fund B - Canada; MSCI Europe Equity Index Fund B; Multi Currency Alpha Tilts Social Screen B; The Obsidian Fund - Aggregate; Pacific ex-Japan Equity Index ESG Screened Fund B; Pan Asia Opportunities Fund B - Jacket; Q-BLK ARS III - Institutional, Ltd.; R3 Capital; Russell Developed ex-U.S. Large Cap Index Fund; Russell Developed ex-U.S. Large Cap Index Fund B; Strategic Income Opportunities Bond Fund; Swiss Performance Index Non-Lendable Fund B; The 32 Capital Yen Fund Ltd.; Total International ex U.S. Index Master Portfolio; U.S. Long Corporate Bond Fund; US Basic Value Open Mother Fund (9810); US Core Bond Mother Fund (9834); US Small Cap Growth Stock Mother Fund (9802); World Alpha Tilts Fund B; World Alpha Tilts Non-Lendable Fund B; World Bond Mother Fund (JPY Hedged) (9816); World Bond Mother Fund (Unhedged) (9815); World ex-U.S. Index Fund A2; World Ex-US Alpha Tilts Fund; World ex-US Alpha Tilts Fund B; World ex-US Alpha Tilts Fund L; World ex-US Alpha Tilts Fund O; World ex-US Small Cap Plus Fund – Jacket; BlueCrest Capital International Master Fund Limited; BlueCrest Capital International Limited; BlueCrest Strategic Limited; BlueCrest Emerging Markets

Fund Limited; BlueCrest Emerging Markets Master Fund Limited; BlueCrest Mercantile Master Fund Limited; BlueCrest Special Situations Master Fund Limited; BlueCrest Volatility Arbitrage Master Fund Limited; BlueCrest Multi Strategy Credit Master Fund Limited; BSMA Limited; BlueCrest Equity Strategies Master Fund Limited; Brevan Howard Equity Strategies Master Fund Limited; Brevan Howard Master Fund Limited; Brevan Howard Multi-Strategy Master Fund Limited; Brevan Howard Strategic Macro Master Fund Limited; Brevan Howard Strategic Opportunities Fund Limited; Brevan Howard Asia Master Fund Limited; WCG Strategies Fund Limited; Fixed Income Shares (Series R); Fixed Income Shares: Series C; Fixed Income Shares: Series M; LVS I LLC; LVS II LLC; LVS II Offshore, L.P.; LVS Offshore I, L.P.; PIMCO Absolute Return Strategy 3 Master Fund LDC; PIMCO Absolute Return Strategy 3 Master Fund LDC with respect to its Class relating to the GBP Class of PIMCO Absolute Return Strategy 3 Offshore Fund Ltd.; PIMCO Absolute Return Strategy 3D Offshore Fund Ltd.; PIMCO Absolute Return Strategy 3E Master Fund LDC with respect to its Class relating to the AUD Class of the PIMCO Absolute Return Strategies 3E Offshore Fund Ltd.; PIMCO Absolute Return Strategy 3E Master Fund LDC with respect to its Class relating to the EURO Institutional Class of the PIMCO Absolute Return Strategies 3E Offshore Fund Ltd.; PIMCO Absolute Return Strategy 3E Master Fund LDC, which is included herein as a plaintiff both on its own behalf, and as successor to PIMCO Absolute Return Strategy 3E Master Fund LDC with respect to its Class relating to the GBP Class of the PIMCO Absolute Return Strategies 3E Offshore Fund Ltd.; PIMCO Absolute Return Strategy 3E Master Fund LDC with respect to its Class relating to the Swedish Krona Institutional Class of the PIMCO Absolute Return Strategy 3E Offshore Fund Ltd.; PIMCO Absolute Return Strategy IV IDF LLC; PIMCO Absolute Return Strategy IV Master Fund LDC; PIMCO Absolute Return Strategy IV Master Fund LDC with respect to its Class relating to the Australian Dollar Institutional Class of the PIMCO Absolute Return Strategies IV Offshore Fund I Ltd.; PIMCO Absolute Return Strategy IV Master Fund LDC with respect to its Class relating to the Canadian Dollar Institutional Class of the PIMCO Absolute Return Strategy IV Offshore Fund 1 Ltd.; PIMCO Absolute Return Strategy IV Master Fund LDC

with respect to its Class relating to the Euro Institutional Class of the PIMCO Absolute Return Strategies IV Offshore Fund I Ltd.; PIMCO Absolute Return Strategy IV Master Fund LDC with respect to its Class relating to the Sterling Institutional Class of the PIMCO Absolute Return Strategies IV Offshore Fund I Ltd.; PIMCO Absolute Return Strategy IV Master Fund LDC with respect to its Class relating to the Yen Institutional Class of the PIMCO Absolute Return Strategies IV Offshore Fund I Ltd.; PIMCO Absolute Return Strategy V Master Fund LDC; PIMCO Absolute Return Strategy V Master Fund LDC with respect to its Class relating to the Euro Institutional Class of the PIMCO Absolute Return Strategies V Offshore Fund Ltd.; PIMCO Australia Management Limited as responsible entity for PIMCO Australian Bond Fund; PIMCO Australia Management Limited as responsible entity for PIMCO Australian Short-Term Bond Fund; PIMCO Australia Management Limited as responsible entity for PIMCO Diversified Fixed Interest Fund; PIMCO Australia Management Limited as responsible entity for PIMCO Emerging Markets Bond Fund; PIMCO Australia Management Limited as responsible entity for PIMCO Global Bond Fund; PIMCO Australia Management Limited as responsible entity for PIMCO Global Credit Fund; PIMCO Australia Management Limited as responsible entity for PIMCO Global Real Return Fund; PIMCO Australia Management Limited as responsible entity for PIMCO Target Return Fund; PIMCO Bermuda Trust II: PIMCO Bermuda Bank Loan Fund (M); PIMCO Bermuda Trust II: PIMCO Bermuda Bank Loan Fund A; PIMCO Bermuda Trust II: PIMCO Bermuda Bank Loan Fund B; PIMCO Bermuda Trust II: PIMCO Bermuda Emerging Markets Bond Fund (M); PIMCO Bermuda Trust II: PIMCO Bermuda Emerging Markets Bond Fund II; PIMCO Bermuda Trust II: PIMCO Bermuda Global Aggregate Ex-Japan (Yen-Hedged) Bond Fund; PIMCO Bermuda Trust II: PIMCO Bermuda Global Aggregate Ex-Japan Bond Fund (M); PIMCO Bermuda Trust II: PIMCO Bermuda U.S. High Yield Fund; PIMCO Bermuda Trust II: PIMCO Bermuda U.S. High Yield Fund (M); PIMCO Bermuda Trust II: PIMCO Bermuda U.S. High Yield Fund II (M); PIMCO Bermuda Trust II: PIMCO Emerging Bond (Yen-Hedged) Income Fund; PIMCO Bermuda Trust II: PIMCO Emerging Bond Income Fund; PIMCO Bermuda Trust II: PIMCO Emerging Bond Income Fund (M); PIMCO

Bermuda Trust II: PIMCO Emerging Bond Income Fund II; PIMCO Bermuda Trust II: PIMCO Emerging Bond Income Fund III; PIMCO Bermuda Trust II: PIMCO U.S. High Yield (Yen-Hedged) Fund; PIMCO Bermuda Trust II: PIMCO U.S. High Yield (Yen-Hedged) Fund II; PIMCO Bermuda Trust II: PIMCO U.S. High Yield Strategy Fund; PIMCO Bermuda Trust II: PIMCO U.S. High Yield Strategy Fund II; PIMCO Bermuda Trust II: PIMCO World High Income; PIMCO Bermuda Trust IV: PIMCO Bermuda Brazil Corporate Bond Fund; PIMCO Bermuda Trust IV: PIMCO Bermuda Brazil Corporate Bond Fund (M); PIMCO Bermuda Trust IV: PIMCO Bermuda Brazil Government Bond Fund; PIMCO Bermuda Trust IV: PIMCO Bermuda Brazil Government Bond Fund (M); PIMCO Bermuda Trust IV: PIMCO Bermuda Emerging Currency High Income Fund; PIMCO Bermuda Trust IV: PIMCO Bermuda Emerging Market High Yield Corporate Bond Fund (M); PIMCO Bermuda Trust IV: PIMCO Bermuda Emerging Market High Yield Corporate Bond Fund A; PIMCO Bermuda Trust IV: PIMCO Bermuda Emerging Market High Yield Corporate Bond Fund B; PIMCO Bermuda Trust IV: PIMCO Bermuda Emerging Markets and Infrastructure Bond Fund (M); PIMCO Bermuda Trust IV: PIMCO Bermuda Emerging Markets and Infrastructure Bond Fund A; PIMCO Bermuda Trust IV: PIMCO Bermuda Emerging Markets and Infrastructure Bond Fund B; PIMCO Bermuda Trust IV: PIMCO Bermuda Global Bond Ex-Japan Fund; PIMCO Bermuda Trust IV: PIMCO Emerging Bond Strategy Fund; PIMCO Bermuda Trust IV: PIMCO Global Bond Strategy Fund; PIMCO Bermuda Trust IV: PIMCO Global High Yield Strategy Fund; PIMCO Bermuda Trust IV: PIMCO U.S. High Yield Strategy Fund A; PIMCO Bermuda Trust IV: PIMCO U.S. High Yield Strategy Fund B; PIMCO Bermuda Trust: PIMCO Bermuda Foreign Low Duration Fund; PIMCO Bermuda Trust: PIMCO Bermuda U.S. Low Duration Fund; PIMCO Bermuda Trust: PIMCO Emerging Markets Bond Fund (JITF); PIMCO Bermuda Trust: PIMCO Emerging Markets Bond Fund (M); PIMCO Bermuda Trust: PIMCO Emerging Markets Bond Fund (Yen-Hedged); PIMCO Bermuda Trust: PIMCO Emerging Markets Bond Fund II; PIMCO Bermuda Trust: PIMCO Emerging Markets Bond Fund III; PIMCO Bermuda Trust: PIMCO Euro Total Return Fund; PIMCO Bermuda Trust: PIMCO Real Return Fund; PIMCO BRAVO Fund

II, L.P.; PIMCO BRAVO Fund, L.P.; PIMCO Canada Canadian CorePLUS Bond Trust; PIMCO Canada Canadian CorePLUS Long Bond Trust; PIMCO Canada Canadian Tactical Bond Trust; PIMCO Canadian Total Return Bond Fund; PIMCO Cayman Commodity Fund I Ltd.; PIMCO Cayman Commodity Fund III, Ltd.; PIMCO Cayman Commodity Fund VII, Ltd.; PIMCO Cayman Commodity Portfolio I Ltd.; PIMCO Cayman SPC Limited: PIMCO Cayman Japan Core Segregated Portfolio; PIMCO Cayman SPC Limited: PIMCO Cayman Japan CorePLUS Segregated Portfolio; PIMCO Cayman SPC Limited: PIMCO Cayman Japan CorePLUS Strategy Segregated Portfolio; PIMCO Cayman SPC Limited: PIMCO Cayman Unconstrained Bond Segregated Portfolio; PIMCO Cayman Trust: PIMCO Asia High Income Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Australian Corporate Fund; PIMCO Cayman Trust: PIMCO Cayman Australian Multi-Sector Fund; PIMCO Cayman Trust: PIMCO Cayman Bank Loan Fund; PIMCO Cayman Trust: PIMCO Cayman Emerging Local Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Emerging Bond Fund (M); PIMCO Cayman Trust: PIMCO Cayman Emerging Bond Fund A; PIMCO Cayman Trust: PIMCO Cayman Emerging Bond Fund B; PIMCO Cayman Trust: PIMCO Cayman Emerging Local Bond Strategy Fund; PIMCO Cayman Trust: PIMCO Cayman European High Yield Fund; PIMCO Cayman Trust: PIMCO Cayman Foreign Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Global Advantage Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Global Advantage Government Ex-Japan Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Global Aggregate Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Global Aggregate Ex-Japan (Yen-Hedged) Bond Fund II; PIMCO Cayman Trust: PIMCO Cayman Global Aggregate Ex-Japan Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Global Aggregate Ex-Japan Income Fund, which is included herein as a plaintiff both on its own behalf, and as successor to PIMCO Cayman Trust: PIMCO Cayman Global Aggregate Ex-Japan (Yen-Hedged) Income Fund; PIMCO Cayman Trust: PIMCO Cayman Global Credit Alpha Fund; PIMCO Cayman Trust: PIMCO Cayman Global Ex-Japan (Yen-Hedged) Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Global Ex-Japan Bond Fund; PIMCO Cayman Trust: PIMCO Cayman Global High Income Fund, which is included herein as a plaintiff

both on its own behalf, and as successor to PIMCO Cayman Trust: PIMCO Cayman Global High Income (Yen-Hedged) Fund; PIMCO Cayman Trust: PIMCO Cayman Japan Bank Capital Fund II (For Qualified Institutional Investors Only); PIMCO Cayman Trust: PIMCO Cayman Japan CorePLUS Fund II; PIMCO Cayman Trust: PIMCO Cayman Mortgage Fund; PIMCO Cayman Trust: PIMCO Cayman U.S. Bond Fund; PIMCO Cayman Trust: PIMCO Cayman U.S. Investment Grade Corporate Bond Fund; PIMCO Cayman Trust: PIMCO Cayman U.S. Investment Grade Intermediate Corporate Bond (Yen-Hedged) Fund; PIMCO Combined Alpha Strategies Master Fund LDC; PIMCO Combined Alpha Strategies Master Fund LDC with respect to its Class relating to US Government/Credit Overlay Share Class of PIMCO Combined Alpha Strategies Offshore Fund Ltd.; PIMCO Commodity Alpha Master Fund Ltd.; PIMCO Corporate & Income Opportunity Fund; PIMCO Corporate & Income Strategy Fund; PIMCO Distressed Credit Fund B, L.P.; PIMCO Distressed Credit Fund, L.P., which is included herein as a plaintiff both on its own behalf, and as successor to PIMCO Distressed Credit Fund Offshore Investments, L.P. ; PIMCO Distressed Senior Credit Opportunities Fund II, L.P.; PIMCO Dynamic Credit and Mortgage Income Fund; PIMCO Dynamic Income Fund; PIMCO Equity Series VIT: PIMCO StocksPLUS® Global Portfolio; PIMCO Equity Series: PIMCO Dividend and Income Fund (f/k/a PIMCO Equity Series: PIMCO Dividend and Income Builder Fund); PIMCO Equity Series: PIMCO EqS Long/Short Fund, which is included herein as a plaintiff both on its own behalf, and as successor to Catamount Partners, LP; PIMCO ETF Trust: PIMCO Active Bond Exchange-Traded Fund; PIMCO Fixed Income Source ETFs plc, PIMCO Covered Bond Source UCITS ETF; PIMCO Fixed Income Source ETFs plc, PIMCO Emerging Markets Advantage Local Bond Index Source UCITS ETF; PIMCO Fixed Income Source ETFs plc, PIMCO Euro Short Maturity Source UCITS ETF; PIMCO Fixed Income Source ETFs plc, PIMCO Short-Term High Yield Corporate Bond Index Source UCITS ETF; PIMCO Fixed Income Source ETFs plc, PIMCO Sterling Short Maturity Source UCITS ETF; PIMCO Flexible Global Bond Fund (Canada); PIMCO Funds Ireland plc, PIMCO Capital Securities Fund; PIMCO Funds Ireland plc, PIMCO European ABS Fund; PIMCO Funds: Global Investors Series plc Euro Bond

Fund; PIMCO Funds: Global Investors Series plc Global Investment Grade Credit Fund; PIMCO Funds: Global Investors Series plc, Commodity Real Return Fund; PIMCO Funds: Global Investors Series plc, Diversified Income Duration Hedged Fund; PIMCO Funds: Global Investors Series plc, Diversified Income Fund; PIMCO Funds: Global Investors Series plc, Emerging Asia Bond Fund; PIMCO Funds: Global Investors Series plc, Emerging Local Bond Fund; PIMCO Funds: Global Investors Series plc, Emerging Markets Bond Fund; PIMCO Funds: Global Investors Series plc, Emerging Markets Corporate Bond Fund; PIMCO Funds: Global Investors Series plc, Emerging Markets Short-Term Local Currency Fund; PIMCO Funds: Global Investors Series plc, Euro Bond Fund; PIMCO Funds: Global Investors Series plc, Euro Credit Fund; PIMCO Funds: Global Investors Series plc, Euro Income Bond Fund; PIMCO Funds: Global Investors Series plc, Euro Long Average Duration Fund; PIMCO Funds: Global Investors Series plc, Euro Low Duration Fund; PIMCO Funds: Global Investors Series plc, Euro Short-Term Fund; PIMCO Funds: Global Investors Series plc, Global Advantage Fund; PIMCO Funds: Global Investors Series plc, Global Advantage Real Return Fund; PIMCO Funds: Global Investors Series plc, Global Bond Ex-US Fund; PIMCO Funds: Global Investors Series plc, Global Bond Fund; PIMCO Funds: Global Investors Series plc, Global High Yield Bond Fund; PIMCO Funds: Global Investors Series plc, Global Investment Grade Credit Fund; PIMCO Funds: Global Investors Series plc, Global Multi-Asset Fund; PIMCO Funds: Global Investors Series plc, Global Real Return Fund; PIMCO Funds: Global Investors Series plc, Income Fund; PIMCO Funds: Global Investors Series plc, Inflation Strategy Fund; PIMCO Funds: Global Investors Series plc, Low Average Duration Fund; PIMCO Funds: Global Investors Series plc, PIMCO Capital Securities Fund; PIMCO Funds: Global Investors Series plc, PIMCO Credit Opportunities Bond Fund (f/k/a PIMCO Funds: Global Investors Series plc, PIMCO Credit Absolute Return Fund); PIMCO Funds: Global Investors Series plc, PIMCO RAE PLUS Emerging Markets Fund (f/k/a PIMCO Funds: Global Investors Series plc, PIMCO RAE Fundamental PLUS Emerging Markets Fund); PIMCO Funds: Global Investors Series plc, PIMCO RAE PLUS Global Developed Fund (f/k/a PIMCO Funds: Global Investors Series plc, PIMCO RAE Fundamental

PLUS Global Developed Fund); PIMCO Funds: Global Investors Series plc, PIMCO RAE PLUS US Fund (f/k/a PIMCO Funds: Global Investors Series plc, PIMCO RAE Fundamental PLUS US Fund); PIMCO Funds: Global Investors Series plc, Socially Responsible Emerging Markets Bond Fund; PIMCO Funds: Global Investors Series plc, StocksPLUS™ Fund, which is included herein as a plaintiff both on its own behalf, and as successor to PIMCO Funds: Global Investors Series plc StocksPLUS Fund (GBP Hedged Share class); PIMCO Funds: Global Investors Series plc, Strategic Income Fund; PIMCO Funds: Global Investors Series plc, Total Return Bond Fund; PIMCO Funds: Global Investors Series plc, UK Corporate Bond Fund; PIMCO Funds: Global Investors Series plc, UK Long Term Corporate Bond Fund; PIMCO Funds: Global Investors Series plc, Dynamic Bond Fund (f/k/a PIMCO Funds: Global Investors Series plc, Unconstrained Bond Fund); PIMCO Funds: Global Investors Series plc, US High Yield Bond Fund; PIMCO Funds: PIMCO CommoditiesPLUS® Strategy Fund; PIMCO Funds: PIMCO CommodityRealReturn Strategy Fund®; PIMCO Funds: PIMCO Credit Opportunities Bond Fund; PIMCO Funds: PIMCO Diversified Income Fund; PIMCO Funds: PIMCO Dynamic Bond Fund; PIMCO Funds: PIMCO Emerging Local Bond Fund; PIMCO Funds: PIMCO Emerging Markets Bond Fund; PIMCO Funds: PIMCO Emerging Markets Corporate Bond Fund; PIMCO Funds: PIMCO Emerging Markets Currency and Short-Term Investments Fund; PIMCO Funds: PIMCO Extended Duration Fund; PIMCO Funds: PIMCO Global Advantage® Strategy Bond Fund; PIMCO Funds: PIMCO Global Bond Opportunities Fund (U.S. Dollar-Hedged); PIMCO Funds: PIMCO Global Bond Opportunities Fund (Unhedged); PIMCO Funds: PIMCO Global Multi-Asset Fund; PIMCO Funds: PIMCO High Yield Fund; PIMCO Funds: PIMCO High Yield Spectrum Fund; PIMCO Funds: PIMCO Income Fund; PIMCO Funds: PIMCO Inflation Response Multi-Asset Fund; PIMCO Funds: PIMCO International Bond Fund (U.S. Dollar-Hedged); PIMCO Funds: PIMCO International Bond Fund (Unhedged); PIMCO Funds: PIMCO Investment Grade Credit Bond Fund; PIMCO Funds: PIMCO Long Duration Total Return Fund; PIMCO Funds: PIMCO Long-Term Credit Bond Fund; PIMCO Funds: PIMCO Long-Term Real Return Fund; PIMCO Funds: PIMCO Low Duration ESG Fund; PIMCO

Funds: PIMCO Low Duration Fund; PIMCO Funds:
 PIMCO Low Duration Income Fund; PIMCO Funds:
 PIMCO Moderate Duration Fund; PIMCO Funds:
 PIMCO Mortgage Opportunities and Bond Fund (f/k/a
 PIMCO Funds: PIMCO Mortgage Opportunities Fund);
 PIMCO Funds: PIMCO RAE Fundamental Advantage
 PLUS Fund; PIMCO Funds: PIMCO RAE PLUS EMG
 Fund; PIMCO Funds: PIMCO RAE PLUS Fund; PIMCO
 Funds: PIMCO RAE PLUS International Fund; PIMCO
 Funds: PIMCO RAE PLUS Small Fund; PIMCO Funds:
 PIMCO RAE Worldwide Fundamental Advantage PLUS
 Fund; PIMCO Funds: PIMCO Real Return Fund; PIMCO
 Funds: PIMCO RealEstateRealReturn Strategy Fund;
 PIMCO Funds: PIMCO RealPath® 2020 Fund; PIMCO
 Funds: PIMCO RealPath® 2025 Fund; PIMCO Funds:
 PIMCO RealPath® 2030 Fund; PIMCO Funds: PIMCO
 RealPath® 2035 Fund; PIMCO Funds: PIMCO RealPath®
 2040 Fund; PIMCO Funds: PIMCO RealPath® 2045
 Fund; PIMCO Funds: PIMCO RealPath® 2050 Fund;
 PIMCO Funds: PIMCO RealPath® Income Fund, which is
 included herein as a plaintiff both on its own behalf, and as
 successor to PIMCO Funds: PIMCO RealRetirement®
 2015 Fund; PIMCO Funds: PIMCO Senior Floating Rate
 Fund; PIMCO Funds: PIMCO Short-Term Fund; PIMCO
 Funds: PIMCO StocksPLUS® Absolute Return Fund;
 PIMCO Funds: PIMCO StocksPLUS® Fund; PIMCO
 Funds: PIMCO StocksPLUS® International Fund (U.S.
 Dollar-Hedged); PIMCO Funds: PIMCO StocksPLUS®
 International Fund (Unhedged); PIMCO Funds: PIMCO
 StocksPLUS® Long Duration Fund; PIMCO Funds:
 PIMCO StocksPLUS® Short Fund; PIMCO Funds:
 PIMCO StocksPLUS® Small Fund; PIMCO Funds:
 PIMCO Strategic Bond Fund; PIMCO Funds: PIMCO
 Total Return ESG Fund; PIMCO Funds: PIMCO Total
 Return Fund; PIMCO Funds: PIMCO Total Return Fund
 IV; PIMCO Funds: Private Account Portfolio Series
 International Portfolio; PIMCO Funds: Private Account
 Portfolio Series Low Duration Portfolio; PIMCO Funds:
 Private Account Portfolio Series PIMCO EM Bond and
 Short-Term Investments Portfolio; PIMCO Funds:
 Private Account Portfolio Series PIMCO High Yield and
 Short-Term Investments Portfolio; PIMCO Funds: Private
 Account Portfolio Series PIMCO Investment Grade Credit
 Bond Portfolio; PIMCO Funds: Private Account Portfolio
 Series PIMCO Long Duration Credit Bond Portfolio;
 PIMCO Funds: Private Account Portfolio Series Real

Return Portfolio; PIMCO Funds: Private Account Portfolio Series Short Term Floating NAV Portfolio II; PIMCO Global Credit Opportunity Master Fund LDC; PIMCO Global StocksPLUS & Income Fund; PIMCO High Income Fund; PIMCO Income Opportunity Fund; PIMCO Income Strategy Fund; PIMCO Income Strategy Fund II; PIMCO Large Cap StocksPLUS Absolute Return Fund; PIMCO Loan Interests and Credit Master Fund Ltd.; PIMCO Luxembourg Trust IV - PIMCO Total Return Fund Multi-Currency Selection; PIMCO Luxembourg Trust IV, PIMCO Total Return Fund; PIMCO Luxembourg Trust IV, PIMCO Total Return Fund II; PIMCO Luxembourg Trust IV, PIMCO Total Return Fund Multi-Currency Selection; PIMCO Luxembourg Trust IV, PIMCO Total Return Strategy Fund; PIMCO Luxembourg Trust, CommoditiesPLUS Strategy Fund; PIMCO Luxembourg Trust, Global Investment Grade Credit Fund; PIMCO Luxembourg Trust, Global Real Return Fund in Swiss Francs; PIMCO Monthly Income Fund (Canada); PIMCO Multi-Asset Volatility Master Fund Ltd.; PIMCO Multi-Asset Volatility Offshore Fund II Ltd.; PIMCO Multi-Sector Strategy Fund Ltd.; PIMCO Offshore Funds - PIMCO Absolute Return Strategy IV eFund; PIMCO Offshore Funds: PIMCO Cayman UK Long Duration Fund; PIMCO Offshore Funds: PIMCO Offshore Funds Overlay Strategies Fund VII; PIMCO Offshore Funds: PIMCO Offshore Funds Overlay Strategies Fund X; PIMCO Offshore Funds: PIMCO Offshore Funds Overlay Strategies Fund XI; PIMCO Offshore Funds: PIMCO U.S. IG Intermediate Corporate Bond Fund; PIMCO Offshore Funds: PIMCO U.S. Investment Grade Corporate Bond Fund; PIMCO Select Funds plc, U.S. High Yield BB-B Bond Fund; PIMCO Select Funds plc, UK Income Bond Fund; PIMCO Select Funds plc, Dynamic Bond Fund (f/k/a PIMCO Select Funds plc, Unconstrained Bond Fund); PIMCO Strategic Income Fund, Inc.; PIMCO Tactical Opportunities Master Fund Ltd.; PIMCO Variable Insurance Trust: PIMCO Balanced Allocation Portfolio; PIMCO Variable Insurance Trust: PIMCO CommodityRealReturn Strategy Portfolio; PIMCO Variable Insurance Trust: PIMCO Dynamic Bond Portfolio; PIMCO Variable Insurance Trust: PIMCO Emerging Markets Bond Portfolio; PIMCO Variable Insurance Trust: PIMCO Global Bond Opportunities Portfolio (Unhedged); PIMCO Variable Insurance Trust: PIMCO Global Core Bond (Hedged) Portfolio; PIMCO

Variable Insurance Trust; PIMCO Global Multi-Asset Managed Allocation Portfolio; PIMCO Variable Insurance Trust; PIMCO High Yield Portfolio; PIMCO Variable Insurance Trust; PIMCO International Bond Portfolio (U.S. Dollar-Hedged); PIMCO Variable Insurance Trust; PIMCO International Bond Portfolio (Unhedged); PIMCO Variable Insurance Trust; PIMCO Low Duration Portfolio; PIMCO Variable Insurance Trust; PIMCO Real Return Portfolio; PIMCO Variable Insurance Trust; PIMCO Short-Term Portfolio; PIMCO Variable Insurance Trust; PIMCO Total Return Portfolio; PIMCO Funds: Private Account Portfolio Series Short-Term Floating NAV Portfolio III, which is included herein as a plaintiff both on its own behalf, and as successor to PIMCO Cayman Japan Fund I Ltd.; StocksPLUS Sub-Fund B, LLC; Terlingua Fund 2, LP; CIT – PIMCO Core Plus Bond Fund; CIT – PIMCO Global Advantage Strategy Collective Trust; CIT – PIMCO Real Return Collective Trust II; CIT – PIMCO Real Return Strategy Fund; CIT – PIMCO RealEstatePLUS Collective Trust; CIT – PIMCO Total Return Collective Trust; CIT – PIMCO Unconstrained Bond Collective Trust; CIT – PIMCO CommoditiesPLUS Collective Trust; AllianzGI Emerging Markets Consumer CIT; and Allianz NFJ International Value CIT,

Plaintiffs,

vs.

BANK OF AMERICA CORPORATION; BANK OF AMERICA, N.A.; BARCLAYS BANK PLC; BARCLAYS PLC; BARCLAYS CAPITAL, INC.; BNP PARIBAS GROUP; BNP PARIBAS USA, INC.; BNP PARIBAS S.A.; BNP PARIBAS SECURITIES CORP.; CITIGROUP, INC.; CITIBANK, N.A.; CITIGROUP GLOBAL MARKETS, INC.; CREDIT SUISSE GROUP AG; CREDIT SUISSE AG; CREDIT SUISSE INTERNATIONAL; CREDIT SUISSE SECURITIES (USA) LLC; DEUTSCHE BANK AG; DEUTSCHE BANK SECURITIES INC.; THE GOLDMAN SACHS GROUP, INC.; GOLDMAN, SACHS & CO. LLC; HSBC HOLDINGS PLC; HSBC BANK PLC; HSBC NORTH AMERICA HOLDINGS INC.; HSBC BANK USA, N.A.; HSBC SECURITIES (USA) INC.; J.P. MORGAN CHASE & CO.; J.P. MORGAN CHASE BANK, N.A.;

J.P. MORGAN SECURITIES LLC; MERRILL LYNCH, PIERCE, FENNER & SMITH INC.; MUFG BANK, LTD.; MUFG SECURITIES AMERICAS INC.; MORGAN STANLEY; MORGAN STANLEY & CO., LLC; MORGAN STANLEY & CO. INTERNATIONAL PLC; NATWEST MARKETS SECURITIES INC.; RBC CAPITAL MARKETS LLC; THE ROYAL BANK OF CANADA; ROYAL BANK OF SCOTLAND PLC; SG AMERICAS SECURITIES LLC; SOCIETE GENERALE S.A.; STANDARD CHARTERED BANK; STANDARD CHARTERED SECURITIES (NORTH AMERICA), INC.; UBS AG; UBS GROUP AG; and UBS SECURITIES LLC,

Defendants.

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NATURE OF THE ACTION

1. This case concerns Defendants' conspiracy to manipulate the foreign exchange ("FX") market. FX is the world's largest and most active financial market, facilitating multiple trillions of dollars in trades every day. Defendants, which are sixteen of the world's largest banks, worked together to manipulate this market for their own financial benefit. Time after time, day after day, year after year, Defendants colluded to "bang the close," "take out the filth," "overbuy," and engage in a variety of other manipulative tactics during the small periods of time when important benchmarks were being measured. Defendants also colluded artificially to inflate bid/ask spreads throughout the day. The intended result of this concerted action was that FX prices were distorted in Defendants' favor. Caught in the wake of Defendants' scheme were the many individuals and firms, including the Plaintiffs, who transacted in the FX market during the period when the market was being distorted.¹

2. Defendants, who together comprise a dominant portion of the FX market, have largely admitted that they colluded to manipulate FX prices. They repeatedly employed every anticompetitive tactic—price fixing, direct communications between competitors, sharing of commercially sensitive information (such as client orders), and other coordinated activity to effectuate their desired market manipulation. This collusion has been thoroughly documented by government regulators from across the globe, who have collectively imposed ***over \$11 billion*** in fines on Defendants.

3. This conspiracy took place at all levels of Defendants' FX operations, and operated largely through the use of numerous multi-bank chatrooms. For instance, in one

¹ Many of these same Plaintiffs will also commence an action in London against many of these same Defendants for manipulation of the FX market, with respect to their FX trades in Europe. For the avoidance of doubt, Plaintiffs are not asserting in this action any FX-related claims that are subject to a final ruling or judgment in their parallel London action.

chatroom fittingly called “The Cartel,” Richard Usher acted as leader and moderator; he operated the chatroom in his position at Defendant RBS until he left in 2010, and then revived it when he joined Defendant JPMorgan the same year. Numerous other traders employed by the Defendants have been part of “The Cartel.” Defendants operated many other private chatrooms in addition to “The Cartel.” These chatrooms were called, among other things, “The Mafia,” “The Club,” “The Bandits’ Club,” “The Dream Team,” “One Team, One Dream,” and “The Sterling Lads.”

4. The collusion among Defendants was facilitated in part because many of these traders had previously worked together and formed social ties. Many of the colluding traders lived near each other, attended the same dinner parties, and were members of the same local golf clubs. These traders also socialized and joked in the chatrooms they used to manipulate the FX market. The seamless transition from social jokes and gossip to agreements to manipulate the FX market facilitated the collusive agreements and practices in which these traders engaged.

5. The people responsible also often were employed by multiple Defendants at different points in their career, which facilitated the collusion as many of the participants were former colleagues. For instance, Chris Ashton of Barclays was co-head of spot trading with Matt Gardiner until Gardiner left Barclays for Citi, at which time Ashton and Gardiner began sharing their customers’ confidential information and colluding to manipulate FX prices. Other overlaps allowed for even more cross-communications. For instance, Richard Usher, Rohan Ramchandani, and Niall O’Riordan were all members of the chief dealers’ subgroup formed under the umbrella of the Bank of England’s London Foreign Exchange Joint Standing Committee. In that role, Usher, Ramchandani and O’Riordan regularly discussed and agreed to manipulate FX prices, despite the fact that such discussions have no legitimate relationship to the Bank of England’s activities. According to two people with knowledge of the meeting, these

traders “talked about how they shared information about orders to reduce the risk of losses in the minutes before benchmarks are calculated.”

6. Sources interviewed by *Bloomberg* have further confirmed that Defendants’ traders “would share details of orders with brokers and counterparts at banks through instant messages to align their strategies” and they “also would seek to glean information about impending trades to improve their chances of getting the desired move.” Traders employed by the Defendants interviewed by the *Wall Street Journal* and *Financial Times* have also confirmed that traders would communicate through “an electronic chat room populated by top traders at financial institutions” and “chatroom discussions between rival traders . . . allowed them to share information about pricing and order books.” Multiple other reports confirm the chatrooms were being used to share confidential information with the intent to help manipulate prices, i.e., to “work[] as a pack” by sequencing trades to their collective advantage.

7. There are various ways, means, and terms to refer to the trading strategies deployed to profit off the collective power Defendants’ wielded. For instance: (1) “front running”—which is an illegal practice—involves trading ahead of expected orders, essentially taking profits in advance when you know the market is about to move a certain way due to an upcoming surge of activity; (2) “banging the close” involves making a high number of trades in a coordinated fashion around a measurement period; (3) “painting the screen” is where orders with other dealers are used to create the illusion of trading activity in a given direction; (4) “taking out the filth” and “clearing the decks” is where unfavorable transactions were netted off between Defendants, delayed, or otherwise handled in such a way as to not hit the market around a measurement period; and (5) “building,” “giving you the ammo,” and other terms refer to Defendants further magnifying the viability of these behaviors by transferring business to one

participant, including so that the timing of execution (or non-execution) could be more centrally controlled. All of these techniques, and others, boil down to the fact that by jointly executing transactions that went one way for a time, while withholding transactions that went the other way at the same time, Defendants could together greatly distort prices in the FX market.

8. Among the cartel's most potent tools was exerting influence on FX benchmark rates. These benchmark rates are set daily by measuring FX transactions at a specific time during the day; the cartel coordinated their respective FX transactions each day to push the benchmarks in a direction that benefited the Defendants. This manipulation is confirmed by a multiplicity of evidence, including government investigations, economic analysis, and thousands of transcripts of electronic communications between traders employed by Defendants.

Ultimately, competition in the FX marketplace was compromised. Market participants were harmed by the non-competitive prices that governed the FX market, and the Defendants knowingly took actions to profit their firms at the expense of their clients. For example, the Defendants coordinated their trades to manipulate the benchmark rates to trigger their clients "stop-loss orders," leading (predictably) to profits for the Defendants and losses for their clients.

9. In addition to manipulating FX benchmark rates, Defendants also colluded to artificially raise the price for currency trades. In an FX spot transaction, a dealer quotes a "bid" (the price it will pay for currency) and an "ask" (the price it will sell currency for). The difference between the bid and the ask is the bid/ask spread. In a free marketplace, Defendants would compete to offer their clients the lowest bid/ask spread, which is the price that the Defendants charge on a currency transaction. There are also thousands of communications demonstrating that Defendants instead colluded to artificially inflate the bid/ask spreads they charged customers.

10. Plaintiffs have commissioned their own independent analyses of the FX market. These analyses corroborate the evidence of FX manipulation uncovered by government regulators, journalists, and plaintiffs in the ongoing FX antitrust class action, *In re Foreign Exchange Benchmark Rates Antitrust Litigation*, No. 13-cv-7789 (LGS) (S.D.N.Y.) (“*In re FX*”).

11. In addition, these analyses go beyond the years that governmental investigators focused on (2008 to 2013), and show that the same anomalous price patterns also occurred to a similar degree in the preceding years of 2003 to 2007. Thus, these analyses demonstrate that Defendants’ manipulation of the FX market was not limited to 2008 to 2013, but extended to the entire 2003 to 2013 period.

12. *In sum*, Defendants already admit that they conspired to manipulate prices in the FX market. The extensive evidence set forth herein confirms that the admitted-to manipulation directly and intentionally impacted prices for FX transactions. Plaintiffs, who traded extensively in the FX market, including on days already identified as those on which prices show particularly strong signs of having been manipulated, were victims of Defendants’ cartel, and bring this Complaint to seek redress.

JURISDICTION AND VENUE

13. This Court has subject matter jurisdiction over this action pursuant Sections 4 and 16 of the Clayton Act (15 U.S.C. §§ 15(a) and 26), and pursuant to 28 U.S.C. §§ 1331 and 1337(a).

14. Venue is proper in this District pursuant to 15 U.S.C. §§ 15(a) and 22 and 28 U.S.C § 1391(b), (c), and (d) because during the relevant period, all the Defendants resided, transacted business, were found, or had agents in this District; a substantial part of the events or

omissions giving rise to these claims occurred in this District; and a substantial portion of the affected interstate trade and commerce discussed herein has been carried out in this District.

15. This Court has personal jurisdiction over each Defendant, because each Defendant: transacted business throughout the United States, including in this District; entered into FX transactions, including spot, forward, options, and futures transactions, throughout the United States, including in this District; had substantial contacts with the United States, including in this District; and/or committed overt acts in furtherance of their illegal scheme and conspiracy in the United States. In addition, the conspiracy was directed at, and had the intended effect of, causing injury to persons residing in, located in, or doing business throughout the United States, including in this District.

16. The activities of Defendants and their co-conspirators were within the flow of, were intended to, and did have a substantial effect on the foreign and interstate commerce of the United States.

THE PARTIES

A. Plaintiffs

17. ***Allianz Plaintiffs.*** Plaintiff Allianz Global Investors GmbH (“AllianzGI GmbH”) is a global investment management firm headquartered in Frankfurt, Germany. AllianzGI GmbH was formerly known, at various times, as Deutscher Investment-Trust Gesellschaft für Wertpapieranlagen mbH, Allianz Global Investors Kapitalanlagegesellschaft mbH, and Allianz Global Investors Europe GmbH. During the relevant period, AllianzGI GmbH and the related Plaintiff management companies and investment funds listed in Appendix A (collectively, the “Allianz Entities”), made and/or managed investments in the FX market.

18. From 2003 to 2013, AllianzGI GmbH and the Allianz Entities engaged in FX spot, forward, option, future and swap transactions, including but not limited to transactions

directly with Defendants Bank of America, MUFG, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan Stanley, RBC, RBS, SG, Standard Chartered, and UBS. AllianzGI GmbH and the Allianz Entities transacted in, among others, the following G10² currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. AllianzGI GmbH and the Allianz Entities also transacted in many emerging market currencies.

19. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, AllianzGI GmbH and the Allianz Entities were deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. AllianzGI GmbH and the Allianz Entities suffered injury to their business or property as a direct and proximate result of Defendants' unlawful conduct.

20. ***Anchorage Plaintiffs.*** Plaintiff Anchorage Capital Group, L.L.C. ("Anchorage") is a private investment manager formed under the laws of the State of Delaware, with its principal place of business in New York, New York. During the relevant period, Anchorage sponsored many investment funds, including the Plaintiff funds listed in Appendix B (collectively, the "Anchorage Funds"). Anchorage had authority to make and manage, and was responsible for making and managing, the Anchorage Funds' investments in the FX market.

21. From 2003 to 2013, Anchorage and the Anchorage Funds engaged in FX spot, forward and option transactions, including but not limited to transactions directly with Defendants Bank of America, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan

² The G10 currencies are the United States dollar ("USD"), the euro ("EUR"), the Japanese yen ("JPY"), the British pound sterling ("GBP"), the Swiss franc ("CHF"), the Australian dollar ("AUD"), the New Zealand dollar ("NZD"), the Canadian dollar ("CAD"), the Swedish krona ("SEK"), and the Norwegian krone ("NOK").

Stanley and UBS. Anchorage and the Anchorage Funds transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. Anchorage and the Anchorage Funds also transacted in many emerging market currencies.

22. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, Anchorage and the Anchorage Funds were deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. Anchorage and the Anchorage Funds suffered injury to their business or property as a direct and proximate result of Defendants' unlawful conduct.

23. **API.** Plaintiff Första AP-fonden ("API") is an independent governmental authority and part of the Kingdom of Sweden. API is regulated by the Swedish National Pension Insurance Fund Act ("Funds Act"), and brings these claims on behalf of the Kingdom of Sweden pursuant to Chapter 3, Section 1 of the Funds Act.

24. From 2003 to 2013, API engaged in FX spot, forward, option, and swap transactions, including but not limited to transactions directly with Defendants Deutsche Bank, UBS, Goldman Sachs, JP Morgan, Morgan Stanley, Citi Bank, BNP Paribas, RBS, HSBC, Barclays, Credit Suisse and Bank of America. API transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. API also transacted in many emerging market currencies.

25. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, API was deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. API has suffered injury to its business or property as a direct and proximate result of Defendants' unlawful conduct.

26. **AP2.** Plaintiff Andra AP-fonden (“AP2”), is an independent governmental authority and part of the Kingdom of Sweden. AP2 is regulated by the Funds Act, and brings these claims on behalf of the Kingdom of Sweden pursuant to Chapter 3, Section 1 of the Funds Act.

27. From 2003 to 2013, AP2 engaged in FX spot, forward, option, and swap transactions, including but not limited to transactions directly with Defendants HSBC, Goldman Sachs, RBS, Morgan Stanley, Citi Bank, UBS Barclays, Deutsche Bank, JP Morgan, RBC, Bank of America, Credit Suisse and BNP Paribas. AP2 transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. AP2 also transacted in many emerging market currencies.

28. As a result of Defendants’ conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, AP2 was deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. AP2 has suffered injury to its business or property as a direct and proximate result of Defendants’ unlawful conduct.

29. **AP3.** Plaintiff Tredje AP-fonden (“AP3”) is an independent governmental authority and part of the Kingdom of Sweden. AP3 is regulated by the Funds Act, and brings these claims on behalf of the Kingdom of Sweden pursuant to Chapter 3, Section 1 of the Funds Act.

30. From 2003 to 2013, AP3 engaged in FX spot, forward, option, and swap transactions, including but not limited to transactions directly with Defendants UBS, HSBC, Morgan Stanley, Citi Bank, Goldman Sachs, Deutsche Bank, Credit Suisse, JP Morgan, Barclays, Bank of America, Societe Generale, BNP Paribas and RBC. AP3 transacted in, among

others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. AP3 also transacted in many emerging market currencies.

31. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, AP3 was deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. AP3 has suffered injury to its business or property as a direct and proximate result of Defendants' unlawful conduct.

32. **AP4.** Plaintiff Fjarde AP-fonden ("AP4") is an independent governmental authority and part of the Kingdom of Sweden. AP4 is regulated by the Funds Act, and brings these claims on behalf of the Kingdom of Sweden pursuant to Chapter 3, Section 1 of the Funds Act.

33. From 2003 to 2013, AP4 engaged in FX spot, forward, option, and swap transactions, including but not limited to transactions directly with Defendants Deutsche Bank, UBS, Bank of America, Morgan Stanley, Goldman Sachs, Citi Bank, JP Morgan, RBC, HSBC, Barclays, RBS, Credit Suisse, Societe Generale and BNP Paribas. AP4 transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. AP4 also transacted in many emerging market currencies.

34. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, AP4 was deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. AP4 has suffered injury to its business or property as a direct and proximate result of Defendants' unlawful conduct.

35. ***BlackRock Plaintiffs.*** Plaintiff BlackRock, Inc. (“BlackRock”) is an investment and asset management firm formed under the laws of Delaware, with its principal place of business in New York, New York. During the relevant period, BlackRock and its wholly owned investment advisory subsidiaries sponsored and/or managed hundreds of investment funds, including the Plaintiff funds listed in Appendix C (collectively, the “BlackRock Funds”). BlackRock’s investment managers had full authority to make and manage, and were responsible for making and managing, the BlackRock Funds’ investments in the FX market.

36. From 2003 to 2013, BlackRock and the BlackRock Funds engaged in FX forward, spot, and swap transactions, including but not limited to transactions directly with Defendants Bank of America, MUFG, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan, Morgan Stanley, RBC, RBS, SG, Standard Chartered, and UBS. BlackRock and the BlackRock Funds transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. They also transacted in many emerging market currencies.

37. As a result of Defendants’ conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, BlackRock and the BlackRock Managed Funds were deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. BlackRock and the BlackRock Funds have suffered injury to their business or property as a direct and proximate result of Defendants’ unlawful conduct.

38. ***BlueCrest Plaintiffs.*** Plaintiff BlueCrest Capital Management Limited (f/k/a BlueCrest Capital Management LLP) (“BlueCrest”) is a global investment management firm formed under the laws of the Channel Islands, and with its principal place of business in Jersey,

Channel Islands. BlueCrest served as investment manager to many investment funds during the relevant period, including the Plaintiff funds listed in Appendix D (collectively, the “BlueCrest Funds”). During the relevant period, BlueCrest had full authority to make and manage the BlueCrest Funds’ investments in the FX market and to appoint affiliated entities as sub-advisors to make and manage the BlueCrest Funds’ investments in the FX market, and did in fact make and manage such investments itself and/or so appointed affiliated sub-advisory entities to make and manage such investments.

39. From 2003 to 2013, BlueCrest and its affiliated sub-advisory entities directed the trading of the BlueCrest Funds, in FX forward, spot, option, and future transactions, including but not limited to transactions directly with Defendants Bank of America, MUFG, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan Stanley, RBC, RBS, SG, Standard Chartered, and UBS. BlueCrest and its affiliated sub-advisory entities directed the trading of the BlueCrest Funds in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. They also transacted in many emerging market currencies.

40. As a result of Defendants’ conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, the BlueCrest Funds were deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. BlueCrest and the BlueCrest Funds suffered injury to their business or property as a direct and proximate result of Defendants’ unlawful conduct.

41. ***Brevan Howard Plaintiffs.*** The Plaintiff funds listed in Appendix E (collectively, the “Brevan Howard Funds”) are investment companies with their place of incorporation and principal place of business in the Cayman Islands.

42. From 2003 to 2013, the Brevan Howard Funds engaged in FX forward, spot, option, future and swap (regular as well as exotics) transactions, including but not limited to transactions directly with the Bank of America, Barclays, BNP Paribas, Citibank, Credit Suisse, Deutsche Bank, HSBC, JP Morgan, RBS and UBS. The purpose of these transactions was varied, but mainly included hedging against currency movements, tactical/strategic trading and speculative trading for profit as well as cash management. The Brevan Howard Funds transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK and USD. The Brevan Howard Funds also transacted in many emerging market currencies as well.

43. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, the Brevan Howard Funds were deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. The Brevan Howard Funds have suffered injury to their business or property as a direct and proximate result of Defendants' unlawful conduct.

44. **CalSTRS.** Plaintiff California State Teachers' Retirement System ("CalSTRS") is the largest teachers' retirement fund in the world, providing benefits to more than 933,000 public educators and beneficiaries in California. Approximately 638,000 of this 933,000 are active or inactive members, and approximately 295,000 are retired members and beneficiaries. CalSTRS was formed under the laws of California, with its principal place of business in Sacramento, California.

45. From 2003 to 2013, CalSTRS engaged in FX forward and spot transactions, including but not limited to transactions directly with Defendants Bank of America, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan

Stanley, RBC, RBS, SG, Standard Chartered, and UBS. CalSTRS transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. CalSTRS also transacted in many emerging market currencies.

46. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, CalSTRS was deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. CalSTRS has suffered injury to its business or property as a direct and proximate result of Defendants' unlawful conduct.

47. **Norges.** Plaintiff Norges Bank ("Norges") is the central bank of Norway. Norges was formed under the laws of Norway, with its principal place of business in Oslo, Norway. It is a separate legal entity wholly owned by the Kingdom of Norway.

48. From 2003 to 2013, Norges engaged in FX forward and spot transactions, including but not limited to transactions directly with Defendants Bank of America, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, RBC, RBS, SG and UBS. Norges transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. Norges also transacted in many emerging market currencies.

49. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, Norges was deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. Norges has suffered injury to its business or property as a direct and proximate result of Defendants' unlawful conduct.

50. **PFA.** Plaintiff PFA Pension, Forsikringsaktieselskab, is Denmark's largest

commercial pension company serving more than 1.2 million customers, with its principal place of business in Denmark. Plaintiff PFA Kapitalforening, an alternative investment fund, is an affiliate of PFA Pension, Forsikringsaktieselskab and was formed under the laws of Denmark with its principal place of business in Denmark. PFA Pension, Forsikringsaktieselskab and PFA Kapitalforening are referred to herein, collectively, as “PFA.”

51. From 2003 to 2013, PFA engaged in FX forward, spot, option, and swap transactions, including but not limited to transactions directly with Defendants Bank of America, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan Stanley, RBC, RBS, SG and UBS. PFA transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. PFA also transacted in many emerging market currencies.

52. As a result of Defendants’ conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, PFA was deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. PFA has suffered injury to its business or property as a direct and proximate result of Defendants’ unlawful conduct.

53. ***PIMCO Plaintiffs.*** Plaintiff Pacific Investment Management Company LLC (“PIMCO”) is an investment and asset management firm formed under the laws of Delaware, with its principal place of business in Newport Beach, California. During the relevant period, PIMCO sponsored hundreds of investment funds, including the Plaintiff funds listed in Appendix F (collectively, the “PIMCO Funds”). PIMCO’s investment managers had full authority to make and manage, and were responsible for making and managing, the PIMCO Funds’ investments in the FX market.

54. From 2003 to 2013, PIMCO and the PIMCO Funds engaged in FX forward, spot, future, option, and swap transactions, including but not limited to transactions directly with Defendants Bank of America, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan Stanley, RBC, RBS, SG, Standard Chartered, and UBS. PIMCO and the PIMCO Funds transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. They also transacted in many emerging market currencies.

55. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, PIMCO and the PIMCO Funds were deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. PIMCO and the PIMCO Funds have suffered injury to their business or property as a direct and proximate result of Defendants' unlawful conduct.

56. ***Portigon and EAA.*** Plaintiff Portigon AG ("Portigon") is a company owned directly and indirectly (via NRW Bank) by the German state of North Rhine-Westphalia. The company was formerly known as WestLB AG and changed its name to Portigon AG on July 2, 2012. WestLB AG was formed on August 30, 2002, following the split of the former Westdeutsche Landesbank Girozentrale into WestLB AG and NRW Bank.

57. Plaintiff Erste Abwicklungsanstalt ("EAA") is an independent public law entity with partial legal capacity operating under the umbrella of Germany's Financial Market Stabilisation Authority (established under the German Financial Market Stabilisation Fund Act of October 17, 2008 (Finanzmarktstabilisierungsfondsgesetz, "FMStFG")). EAA is a winding-up agency within the meaning of the FMStFG.

58. EAA has, since 2009, been winding up portfolios of transactions acquired from

WestLB AG, operating under the name of Portigon AG since July 2, 2012, and/or its German or foreign subsidiaries. EAA was incorporated in Dusseldorf, Germany, and EAA's principal place of business is also Dusseldorf, Germany. The acquisition of the portfolios included a sizeable number of FX related trading transactions as at July 2, 2012, together with economic risk responsibility for the ongoing management of these transactions and the responsibility for the risks associated with the historic activities of the former Portigon trading divisions.

59. From 2003 to 2013, Portigon engaged in FX forward, spot, option, and swap transactions, including but not limited to transactions directly with Defendants Bank of America, MUFG, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan Stanley, RBC, RBS, SG, Standard Chartered, and UBS. Portigon transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. Portigon also transacted in many emerging market currencies.

60. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, Portigon and EAA were deprived of transacting in a lawful, non-manipulative, competitive market for FX transactions. Portigon and EAA have suffered injury to their business or property as a direct and proximate result of Defendants' unlawful conduct.

61. **PRIM Board.** Plaintiff Pension Reserves Investment Management Board of Massachusetts ("PRIM Board") was created by Massachusetts legislation enacted and signed into law in 1983, and has its primary place of business in Boston, Massachusetts. PRIM Board is charged with the investment management and supervision of the Pension Reserves Investment Trust ("PRIT") Fund, which contains the pension assets (approximately \$72 billion) of the Massachusetts Teachers' Retirement System, the Massachusetts State Employees' Retirement

System, and approximately 100 county and municipal retirement systems in Massachusetts. Massachusetts General Laws ch. 32 § 22(8) establishes that PRIM Board shall hold ownership and control of the assets of the PRIT Fund. Massachusetts General Laws ch. 32 § 23(2A) establishes PRIM Board and charges it with general supervision of the PRIT Fund, and gives PRIM Board the authority to commence and pursue lawsuits, including this litigation.

62. From 2003 to 2013, PRIM Board and the PRIT Fund engaged in FX forward, spot and swap transactions, including but not limited to transactions directly with Defendants Bank of America, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan Stanley, RBC, RBS, SG, Standard Chartered and UBS. PRIM Board and the PRIT Fund transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. PRIM Board and the PRIT Fund transacted in many emerging market currencies.

63. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, PRIM Board and the PRIT Fund were deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. PRIM Board and the PRIT Fund have suffered injury to its business or property as a direct and proximate result of Defendants' unlawful conduct.

64. ***SEI Plaintiffs.*** Plaintiff SEI Trust Company ("SEI") is a trust company formed under the laws of the Commonwealth of Pennsylvania, with its principal place of business in Oaks, Pennsylvania. During the relevant period, SEI sponsored collective investment trusts, including the Plaintiff funds listed in Appendix G (collectively, the "SEI Funds"). SEI's investment managers had the requisite authority to make and manage, and were responsible for making and managing, the SEI Funds' investments in the FX market within the terms of the

investment guidelines set by SEI. Each of the SEI Funds is a bank-maintained collective investment trust whose principal place of business is in Pennsylvania.

65. From 2003 to 2013, SEI and the SEI Funds engaged in FX forward, spot, option, and swap transactions, including but not limited to transactions directly with Defendants Bank of America, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Morgan Stanley, RBC, RBS, SG, Standard Chartered, and UBS. SEI and the SEI Funds transacted in, among others, the following G10 currencies: AUD, CAD, CHF, EUR, GBP, JPY, NOK, NZD, SEK, and USD. SEI and the SEI Funds also transacted in many emerging market currencies.

66. As a result of Defendants' conspiracy to manipulate the FX market, including manipulation of FX benchmarks, bid/ask spreads, and the other misconduct described herein, SEI and SEI Funds were deprived of transacting in a lawful, non-manipulative, competitive market for FX investments. SEI and SEI Funds have suffered injury to their business or property as a direct and proximate result of Defendants' unlawful conduct.

B. Defendants

67. Whenever in this Complaint reference is made to any act, deed, or transaction of any entity, the allegation means that the corporation engaged in the act, deed, or transaction by or through its officers, directors, agents, employees, or representatives while they were actively engaged in the management, direction, control, or transaction of the entity's business or affairs.

68. ***Bank of America Defendants.*** Defendant Bank of America Corporation ("BAC") is a corporation organized and existing under the laws of Delaware with its principal place of business in Charlotte, North Carolina. BAC has extensive operations in New York, including its investment banking division, which is located in New York, New York.

69. Defendant Bank of America, N.A. (“BANA”) is a federally chartered national banking association with its principal place of business in Charlotte, North Carolina. BANA is a wholly owned subsidiary of BAC, and has extensive operations in New York. For instance, BANA maintains one of its largest branches, with at least hundreds of employees, located at the “Bank of America Tower,” in New York, New York.³

70. Defendant Merrill Lynch, Pierce, Fenner & Smith Inc. (“MLPFS”) is a corporation organized and existing under the laws of Delaware with its principal place of business in New York, New York. MLPFS is the successor (by merger) to Banc of America Securities LLC, and is a wholly owned subsidiary of BAC. MLPFS is registered as a broker-dealer with the SEC, registered as a futures merchant with the Commodity Futures Trading Commission (“CFTC”), and is a clearing firm member of CME Clearing, which is the clearing house division of the CME, one of the world’s largest futures exchanges.

71. As used herein, the term “BofA” includes Defendants BAC, BANA, MLPFS, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

72. During the relevant period, BofA was a major participant in the FX market (including by transacting in spots, forwards, futures, and options) and a major dealer for FX spot and forward transactions. For instance, the Office of the Comptroller of the Currency (“OCC”) observed that BANA “engages in foreign exchange business (including G10 and other currencies, sales and trading in spot, forwards, options, and other derivatives)” and “was an

³ Bank of America, *Locations*, <https://locators.bankofamerica.com/ny/newyork/financial-centers-new-york-16579.html>.

active dealer in the G10 spot foreign exchange market during the period from 2008 to 2013.”⁴

BofA also consistently appears on *Euromoney*’s surveys of the top participants in the global FX market. And as noted above, MLPFS is a registered futures merchant and a clearing member of the CME.

73. BofA entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. BofA had extensive FX trading operations in the United States, including in New York. During the relevant period, BofA had, within the United States and New York, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

74. In addition, many of BofA’s collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. These collusive and manipulative acts harmed BofA’s FX customers in the United States, as well as the broader FX market in the United States.

75. As detailed below, governmental regulators, including regulators in the United States, have specifically targeted BofA as part of their ongoing investigations into the manipulation of the FX market. BofA has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.

⁴ Consent Order, *In the Matter of Bank of America, N.A.*, AA-EC-14-99 (Nov. 11, 2014), <https://www.occ.treas.gov/news-issuances/news-releases/2014/nr-occ-2014-157a.pdf>.

76. **MUFG Defendants.** Defendant MUFG Bank, Ltd. (“MUFG Bank”), formerly Bank of Tokyo Mitsubishi UFJ, is a Japanese company headquartered in Tokyo, Japan. MUFG Bank is Japan’s largest bank, and also has substantial operations in the United States. MUFG Bank has branches and representative offices throughout the United States, including locations and employees in New York, New York. MUFG Bank is a registered with the Federal Reserve Bank of New York (the “New York Fed”) as a foreign bank licensed to do business in the United States, with \$265 billion of assets in the United States and \$131 billion of assets in its New York City branch. MUFG Bank’s New York branch is also licensed by the New York State Department of Financial Services (the “DFS”) with a registered address in New York, New York.

77. Defendant MUFG Securities Americas Inc. (“MUFG Securities”) is a corporation with its principal place of business in New York, New York. MUFG Securities is an affiliate of MUFG Bank, and a wholly owned subsidiary of Mitsubishi UFJ Securities Holding Co., Ltd., which is a Japanese holding company. MUFG Securities is a registered broker-dealer with FINRA, and a Futures Commission Merchant with the CFTC.

78. As used herein, the term “MUFG” includes Defendants MUFG Bank, MUFG Securities, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

79. During the relevant period, MUFG was a major participant in the FX market (including by transacting in spots, forwards, futures, and options) and a major dealer for FX spot

and forward transactions. For example, on its website, MUFG Bank includes “forex (foreign exchange, currency option, etc.)” as one of the “Products and Services” that it offers clients.⁵

80. MUFG entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. MUFG Bank had extensive FX trading operations in the United States, including in New York, both directly and through its subsidiaries. For instance, the statement on MUFG Bank’s website that “forex” is one of the bank’s “Products and Services” carries over to the webpage for the New York branch of MUFG Bank, which also includes FX as one of the services offered to clients.⁶ In 2012, Hitoshi Suzuki, MUFG Bank’s Head of Global Markets, stated to the press that MUFG Bank’s New York office was one of the “traditional hubs” for MUFG Bank’s FX trading business.⁷ And in a December 2013 Report of Assets and Liabilities filed with the U.S. Federal Financial Institutions Examination Council (“FFIEC”), MUFG Bank reported for its New York branch alone outstanding FX transactions of over \$69 billion.⁸ MUFG Securities also had significant FX trading operations in the United States, including at its principal place of business in New York, New York. During the relevant period, MUFG had, within the United States and New York, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

⁵ Bank of Tokyo-Mitsubishi, *Products & Services*, <http://www.bk.mufg.jp/global/productsandservices/index.html>.

⁶ Bank of Tokyo-Mitsubishi, *New York*, <http://www.bk.mufg.jp/global/globalnetwork/americas/newyork.html>.

⁷ Shigeru Sato and Takako Taniguchi, *Forex, fixed-income traders: Mitsubishi UFJ is hiring*, Bloomberg (April 23, 2012), <http://m.futuresmag.com/2012/04/23/forex-fixed-income-traders-mitsubishi-ufj-is-hirin>.

⁸ FFIEC, *Report of Assets and Liabilities of U.S. Branches and Agencies of Foreign Banks* (Dec. 31, 2013), https://www.ffiec.gov/nicpubweb/nicweb/InstitutionProfile.aspx?parID_Rssd=444819&parDT_END=20051231.

81. In addition, many of MUFG's collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. These collusive and manipulative acts harmed MUFG's FX customers in the United States, as well as the broader FX market in the United States.

82. ***Barclays Defendants.*** Defendant Barclays PLC is a multinational financial services company organized and existing under the laws of the United Kingdom, with its principal place of business in London, England.

83. Defendant Barclays Bank PLC ("Barclays Bank") is a corporation organized and existing under the laws of the United Kingdom with its principal place of business in London, England. Barclays Bank has substantial operations in the United States, including in New York. Barclays Bank has branches and representative offices throughout the United States, including locations and employees in New York, New York. In addition, Barclays Bank is registered as a financial holding company with the New York Fed, and Barclays Bank's New York branch is licensed by the DFS with a registered address in New York, New York.⁹

84. Defendant Barclays Capital, Inc. ("BarCap") is a corporation organized and existing under the laws of Connecticut, with its principal place of business in New York, New York. BarCap is a subsidiary of Barclays Bank. BarCap engages in investment banking and

⁹ DFS Press Release, *New York Banking Department Approves License for Barclays Bank PLC to Open Representative Office in Long Island City* (Nov. 25, 2008), <http://www.dfs.ny.gov/about/press/pr081125.htm>.

investment management services. BarCap is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

85. As used herein, the term “Barclays” includes Defendants Barclays PLC, Barclays Bank, BarCap, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

86. During the relevant period, Barclays was a major participant in the market for FX instruments (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For instance, on its website Barclays touts its “experience and capability as the third largest foreign exchange bank by global market share.”¹⁰ That is consistent with Barclays’ consistent appearance toward the top of *Euromoney*’s surveys of the main participants in the global FX market. Barclays also advertises BARX FX, the electronic FX trading platform through which Barclays acts as a dealer for FX spot and forward transactions.¹¹ And as noted above, BarCap is a registered futures merchant and a clearing member of the CME.

87. Barclays entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. Barclays PLC and Barclays Bank had extensive FX trading operations in the United States, including in New York, both directly and through their subsidiaries. For instance, in a Consent Order by the New York State Department of Financial Services (“DFS”), Barclays Bank and its New York Branch acknowledged that one of the bank’s “primary FX trading centers” is

¹⁰ Barclays, *Corporate Banking Foreign Exchange*, <http://www.barclayscorporate.com/products-and-solutions/risk-solutions/foreign-exchange.html>.

¹¹ Barclays, *BarX: Foreign Exchange*, <http://www.barx.com/client-offering/foreign-exchange.html>.

New York City.¹² In a criminal Plea Agreement with the United States Department of Justice (“DOJ”), Barclays PLC similarly acknowledged that it “acted as a dealer, in the United States and elsewhere, for currency traded in the FX Spot Market” and “purchased and sold substantial quantities of the EUR/USD currency pair in a continuous and uninterrupted flow of interstate and U.S. important trade and commerce to customers and counterparties located in U.S. states other than the U.S. states or foreign countries in which the defendant agreed to purchase or sell these currencies.”¹³ Barclays also had significant FX trading operations in the United States, including at its principal place of business in New York, New York. During the relevant period, Barclays had, within the United States and New York, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

88. In addition, many of Barclays’ collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. For instance, Barclays Bank admitted to the DFS that its New York branch “engaged in manipulative conduct and attempted to manipulate” FX benchmarks, and that many of the employees involved in the misconduct were located at Barclays’ offices in New York, including a vice president in the New York branch, the head of the FX spot desk in New York, a director on the emerging markets desk in New York, a managing director in FX Hedge Fund Sales in New York, and a

¹² Consent Order at ¶ 3, *In the Matter of Barclays Bank PLC, et al.* (May 19, 2015), <http://dfs.ny.gov/about/ea/ea150520.pdf>.

¹³ Plea Agreement at 4, *U.S. v. Barclays PLC* (D. Conn. May 20, 2015), <http://www.justice.gov/file/440481/download>.

director in FX Real Money Sales in New York, among others.¹⁴ Barclays PLC similarly admitted to the DOJ that it “agree[d] to eliminate competition in the purchase and sale of the EUR/USD currency pair in the United States and elsewhere,” and that its “business activities . . . in connection with the purchase and sale of the EUR/USD currency pair, were the subject of this conspiracy and were within the flow of, and substantially affected, interstate and U.S. important trade and commerce. The conspiracy had a direct effect on trade and commerce within the United States, as well as on U.S. import trade and commerce, and was carried out, in part, within the United States.”¹⁵ These collusive and manipulative acts harmed Barclays’ FX customers in the United States, as well as the broader FX market in the United States.¹⁶

89. As further detailed below, governmental regulators, including regulators in the United States, have specifically targeted Barclays as part of their ongoing investigations into the manipulation of the FX market. Barclays has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.

90. **BNP Paribas Defendants.** Defendant BNP Paribas S.A. (“BNPSA”) is a multinational financial services company organized and existing under the laws of France, with its principal place of business in Paris, France. BNPSA has substantial operations in the United States, including in New York. For instance, BNPSA has three branches in the United States, including one in New York. BNPSA also has one agency office and two representative offices

¹⁴ Consent Order at ¶ 73, *In the Matter of Barclays Bank PLC, et al.* (May 20, 2015), <https://www.dfs.ny.gov/about/ea/ea150520.pdf>.

¹⁵ Plea Agreement at 3, *U.S. v. Barclays PLC* (D. Conn. May 20, 2015), <http://www.justice.gov/file/440481/download>.

¹⁶ Consent Order at ¶¶ 73-75, *In the Matter of Barclays Bank PLC, et al.* (May 20, 2015), <https://www.dfs.ny.gov/about/ea/ea150520.pdf>.

in the United States. In addition, BNPSA is registered with the DFS to do business in New York. As of the end of 2015, BNPSA had at least 780 full-time employees in the United States, of which 78% were employed in New York. BNPSA operates a “Corporate Coverage team” in New York, which offers all of BNP Paribas’ products.¹⁷ For the year ending December 31, 2016, BNP Paribas S.A. reported revenues from its operations in the United States of €4.456 billion (\$4.689 billion).¹⁸

91. Defendant BNP Paribas Group (“BNP Group”) is a company organized and existing under the laws of France with its principal place of business in Paris, France. BNP Group has substantial operations in the United States, including in New York. BNP Group has branches and representative offices throughout the United States, including locations and employees in New York, New York. In addition, BNP Group is licensed by the New York DFS, with a registered address in New York, New York.

92. Defendant BNP Paribas USA, Inc. (“BNPUSA”), formerly known as BNP Paribas North America, Inc., is a corporation organized and existing under the laws of Delaware with its principal place of business in New York, New York. BNPUSA engages in investment banking and securities brokerage activities, and is an affiliate of BNP Group.

93. Defendant BNP Paribas Securities Corp. (“BNPS”) is a corporation organized and existing under the laws of Delaware with its principal place of business in New York, New York. BNPS is a wholly owned subsidiary of BNPUSA. BNPS is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing. In March 2018, BNPS acquired BNP Paribas Prime Brokerage, Inc. (“BNPPB”), a

¹⁷ See BNP Paribas, *Registration Document and Annual Financial Report 2016*, at 13 (2017).

¹⁸ *Id.* at 538.

corporation organized under the laws of Delaware with its principal place of business in New York, New York. During the relevant time period, BNPPB was a wholly owned subsidiary of BNPUSA and was registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

94. As used herein, the term “BNP Paribas” includes Defendants BNPSA, BNP Group, BNPUSA, BNPS, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

95. During the relevant period, BNP Paribas was a major participant in the market for FX instruments (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. In its 2012 Annual Report, BNP Paribas described itself as a “major and innovating player” in global fixed-income markets, including by “providing pricing and liquidity across Credit, Rates, and FX.”¹⁹ BNP Paribas also consistently appears on *Euromoney*’s surveys of the top participants in the global FX market. And as noted above, BNPS is a registered futures merchant and clearing member of the CME.

96. BNP Paribas entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. BNPSA and BNP Group had extensive FX trading operations in the United States, including in New York, both directly and through their U.S. subsidiaries. For instance, in an Order to Cease and Desist, the Board of Governors of the Federal Reserve (the “Federal Reserve Board”) described how BNPSA “conducts operations in the United States” through its holding companies, including specifically as to FX, describing how the bank “serves as a foreign exchange [] dealer, both in the United States and in its offices abroad, by buying and selling U.S.

¹⁹ BNP Paribas 2012 Annual Report, https://invest.bnpparibas.com/sites/default/files/documents/rapport_annuel_2012_bnpparibas.pdf.

by buying and selling U.S. dollars and foreign currency for its own account and by soliciting and receiving orders through communications between customers and sales personnel that are executed in the spot market.”²⁰ In a March 2013 Report of Assets and Liabilities filed with the FFIEC, BNP Paribas reported that its New York branch alone had outstanding FX transactions of over \$36 billion.²¹ BNPUSA, BNPPB, and BNPS also each had significant FX trading operations in the United States, including at their principal place of business in New York, New York. During the relevant period, BNP Paribas had, within the United States and New York, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

97. In addition, many of BNP Paribas’ collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. For instance, the Criminal Information statement filed against BNP Paribas by the DOJ described how the foreign bank, both directly and through its holding companies, “entered into and engaged in a combination and conspiracy to suppress and eliminate competition by fixing prices for CEEMEA currencies traded in the United States and elsewhere.”²² BNP Paribas also

²⁰ Order to Cease and Desist, *In the Matter of BNP Paribas S.A., et al.*, Dkt. No. 17-020 (Jul. 16, 2017), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20170717a1.pdf>.

²¹ FFIEC, *Report of Assets and Liabilities of U.S. Branches and Agencies of Foreign Banks* (Dec. 31, 2013), https://www.ffiec.gov/nicpubweb/nicweb/InstitutionProfile.aspx?parID_Rssd=444819&parDT_END=20051231.

²² Statement of Information, *U.S. v. BNP Paribas USA, Inc.*, 18-cr-0061 (S.D.N.Y. Jan. 25, 2018), <https://www.justice.gov/atr/case-document/file/1029711/download>.

admitted to the DFS that “misconduct engaged in by more than a dozen BNP Paribas traders and salespersons was broad; sometimes very deep; involved employees located in both New York and other BNP locations across the globe; and occurred over an extended period of time.”²³ These collusive and manipulative acts harmed BNP Paribas’ FX customers in the United States, as well as the broader FX market in the United States.

98. As further detailed below, governmental regulators, including regulators in the United States, have specifically targeted BNP Paribas as part of their ongoing investigations into the manipulation of the FX market. BNP Paribas has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.²⁴

99. **Citi Defendants.** Defendant Citigroup, Inc. (“Citigroup”) is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business in New York, New York.

100. Defendant Citibank N.A. (“Citibank”) is a federally chartered national banking association with its principal place of business in New York, New York. Citibank is a wholly owned subsidiary of Citigroup.

101. Defendant Citigroup Global Markets Inc. (“CGMI”) is a corporation organized and existing under the laws of the State of New York, with its principal place of business in New York, New York. CGMI is a wholly owned subsidiary of Citigroup. CGMI is registered as a

²³ Consent Order at ¶ 4, *In the Matter of BNP Paribas S.A., et al.* (May 24, 2017), <https://www.dfs.ny.gov/about/ea/ea170524.pdf>.

²⁴ Nicole Hong, *BNP Paribas to pay \$350m to settle FX allegations*, Financial News (May 25, 2017), <https://www.fnlonon.com/articles/bnp-paribas-to-pay-350m-to-settle-fx-allegations-20170525>.

broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

102. As used herein, the term “Citi” includes Defendants Citigroup, Citibank, CGMI, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

103. During the relevant period, Citi was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For example, in its 2013 Annual Report, Citigroup touted its ranking as “Best FX Bank” in various industry publications.²⁵ And in a Resolution Plan filed with the FDIC, Citigroup and Citibank listed as a “core business line” its FX operations, which “include[s] foreign exchange spot, forwards and derivatives.”²⁶ Citi also consistently appears toward the top of *Euromoney*’s surveys of the top participants in the global FX market. And in its Consent Orders on Citi, the OCC observed that Citi “engages in foreign exchange business (including G10 and other currencies, sales and trading in spot, forwards, options, or other derivatives)” and “was an active dealer in G10 spot foreign exchange market.” In addition, as noted above, CGMI is a registered futures merchant and a clearing member of the CME.

104. Citi entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. Citi had extensive FX trading operations in the United States, including in New York. During the relevant period, Citi had, within the United States and New York, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

²⁵ Citigroup Inc. 2013 Annual Report, <http://www.citigroup.com/citi/investor/quarterly/2014/annual-report/>.

²⁶ FDIC Resolution Plan for Citigroup Inc. & Citibank, N.A. (Jun. 29, 2012), <https://www.fdic.gov/regulations/reform/resplans/plans/citi-1207.pdf>.

105. In addition, many of Citi's collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. These collusive and manipulative acts harmed Citi's FX customers in the United States, as well as the broader FX market in the United States.

106. As detailed below, governmental regulators, including regulators in the United States, have specifically targeted Citi as part of their ongoing investigations into the manipulation of the FX market. Citi has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.

107. ***Credit Suisse Defendants.*** Defendant Credit Suisse Group AG ("CSGAG") is a financial holding company organized and existing under the laws of Switzerland with its principal place of business in Zurich, Switzerland. CSGAG has substantial operations in the United States, including in New York. CSGAG is licensed by the New York Department of Financial Services with a registered address in New York, New York.

108. Defendant Credit Suisse AG ("CSAG") is a bank organized and existing under the laws of Switzerland with its principal place of business in Zurich, Switzerland. CSAG is a wholly owned subsidiary of CSGAG. CSAG has substantial operations in the United States, including in New York. For instance, CSAG has a major branch and thousands of employees in New York, and is licensed by the DFS with a registered address in New York, New York. In

addition, CSAG is subject to regulation by the New York Fed, as a “covered bank” under Dodd-Frank.

109. Defendant Credit Suisse Securities (USA) LLC (“CSS”) is a limited liability company organized and existing under the laws of Delaware, with its principal place of business in New York, New York. CSS is a wholly owned subsidiary of CSGAG. CSS is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing. CSS is also registered with FINRA.

110. Defendant Credit Suisse International (“CSI”) is a company organized under the laws of the United Kingdom with its principal place of business in London, United Kingdom. CSI is a subsidiary of CSGAG. Approximately 25% of CSI’s credit risk exposures were attributable to the United States in 2017.²⁷ CSI is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing. CSS is also registered with FINRA.

111. As used herein, the term “Credit Suisse” includes Defendants CSGAG, CSAG, CSS, CSI, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

112. During the relevant period, Credit Suisse was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For instance, in a Resolution Plan filed with the Federal Reserve Board, CSGAG stated that its “most frequently used freestanding derivative products, entered into for trading and risk management purposes, include interest rate, credit default and cross-

²⁷ Credit Suisse International, *Annual Report* (2017), <https://www.credit-suisse.com/media/assets/investment-banking/docs/financial-regulatory/international/csi-annual-report-2017.pdf>.

currency swaps, interest rate and foreign exchange options, foreign exchange forward contracts and foreign exchange and interest rate futures.”²⁸ Similarly, in its 2013 Annual Report, CSGAG stated that its FX business includes “market making in products such as spot and options.”²⁹ In addition, Credit Suisse consistently appears on *Euromoney*’s surveys of the top participants in the global FX market. And as noted above, CSS and CSI are registered futures merchants and clearing members of the CME.

113. Credit Suisse entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. CSGAG and CSAG had extensive FX trading operations in the United States, including in New York, both directly and through their subsidiaries. For instance, in a Consent Order by the New York DFS, CSAG and its New York Branch acknowledged that the bank “conducts FX trading operations in New York,” which it considered one of its “global FX hubs.”³⁰ CSS also had significant FX trading operations at its principal place of business in New York, New York. During the relevant period, Credit Suisse had, within the United States and New York, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

114. In addition, many of Credit Suisse’s collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York where Credit Suisse

²⁸ Credit Suisse Global Recovery and Resolution Plan (Jun. 30, 2014), <http://www.federalreserve.gov/bankinforeg/resolution-plans/credit-suisse-1g-20140701.pdf>.

²⁹ Credit Suisse Group AG Form 20-F: 2013 Annual Report (Apr. 3, 2014), <https://www.credit-suisse.com/media/assets/corporate/docs/about-us/investor-relations/financial-disclosures/financial-reports/20f-2013.pdf>.

³⁰ Consent Order at ¶ 10, *In the Matter of Credit Suisse AG, et al.* (Nov. 13, 2017), <http://www.dfs.ny.gov/about/ea/ea171113.pdf>.

conducts some of its FX trading operations.³¹ Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. For instance, as part of the agreement CSAG reached with the DFS, the bank was required to “review and report to the Department about the Bank’s remedial efforts with regards to its FX business as it affects or pertains to the New York Branch or New York customers” specifically.³² These collusive and manipulative acts harmed Credit Suisse’s FX customers in the United States, as well as the broader FX market in the United States.

115. As further detailed below, governmental regulators, including regulators in the United States, have specifically targeted Credit Suisse as part of their ongoing investigations into the manipulation of the FX market. Credit Suisse has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.

116. ***Deutsche Bank Defendants.*** Defendant Deutsche Bank AG is a financial services company organized and existing under the laws of Germany with its principal place of business in Frankfurt, Germany. Deutsche Bank AG has substantial operations in the United States, including in New York. Deutsche Bank AG has a regional branch office in New York, New York, which is licensed through the New York Financial Services Division, and is regulated by the Federal Reserve Board and the CFTC as a registered swap dealer. Deutsche Bank has described its New York branch as a Material Entity, which is defined as “significant to the activities of a core

³¹ *Id.*

³² *Id.*

business line or critical operation.”³³ The New York branch “engag[es] primarily in traditional lending and deposit activities, as well as trading activities dealing with derivatives . . . and cash financial products.”

117. Deutsche Bank Securities Inc. (“DBSI”) is a corporation organized and existing under the laws of Delaware with its principal place of business in New York, New York. DBSI is an indirect wholly owned subsidiary of Deutsche Bank AG. DBSI is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

118. As used herein, the term “Deutsche Bank” includes Defendant Deutsche Bank AG, DBSI, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

119. During the relevant period, Deutsche Bank was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For instance, in a Resolution Plan filed with the Federal Reserve, Deutsche Bank designated FX trading as a “core business line,” and explained that it “engages in all aspects of the foreign exchange business, including in standard spot, FX derivatives, and forward markets and electronic trading.”³⁴ In addition, Deutsche Bank consistently appears at the top spot on *Euromoney’s* surveys of the top participants in the global FX market. Deutsche Bank also advertises Autobahn, the electronic FX trading platform through which Deutsche Bank acts as a dealer for FX spot and forward transactions. And as noted above, DBSI is a registered futures merchant and a clearing member of the CME.

³³ *Deutsche Bank U.S. Resolution Plan* (Jul. 1, 2014), <http://www.federalreserve.gov/bankinforeg/resolution-plans/deutsche-bank-1g-20140701.pdf>.

³⁴ *Id.*

120. Deutsche Bank entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. Deutsche Bank AG had extensive FX operations in the United States, including in New York, both directly and through its subsidiaries. For instance, in an Order to Cease and Desist, the Federal Reserve Board described how Deutsche Bank AG “conducts operations in the United States,” including specifically as to FX, describing how the foreign bank “serves as a foreign exchange . . . dealer, both in the United States and in its offices abroad, by buying and selling U.S. dollars and foreign currency for its own account and by soliciting and receiving orders through communications between customers and sales personnel that are executed in the FX market.”³⁵ In a December 2013 Report of Assets and Liabilities filed with the FFIEC, Deutsche Bank AG reported for its New York branch alone outstanding FX transactions of over \$93 billion.³⁶ DBSI also had significant FX trading operations in the United States, including at its principal place of business in New York, New York. During the relevant period, Deutsche Bank had, within the United States, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

121. In addition, many of Deutsche Bank’s collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York.

³⁵ Order to Cease and Desist, *In the Matter of Deutsche Bank AG, et al.*, Dkt. No. 17-008 (Apr. 20, 2017), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20170420a1.pdf>.

³⁶ FFIEC, *Report of Assets and Liabilities of U.S. Branches and Agencies of Foreign Banks* (Dec. 31, 2013), https://www.ffiec.gov/nicpubweb/nicweb/InstitutionProfile.aspx?parID_Rssd=444819&parDT_END=20051231.

122. These collusive and manipulative acts harmed Deutsche Bank's FX customers in the United States, as well as the broader FX market in the United States.

123. As further detailed below, governmental regulators, including regulators in the United States, have specifically targeted Deutsche Bank as part of their ongoing investigations into the manipulation of the FX market. Deutsche Bank has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.³⁷

124. ***Goldman Sachs Defendants.*** Defendant The Goldman Sachs Group, Inc. ("GSG") is a corporation organized and existing under the laws of Delaware with its principal place of business in New York, New York. GSG is a bank holding company and a financial holding company.

125. Defendant Goldman, Sachs & Co. LLC ("GSC") is a corporation organized and existing under the laws of New York with its principal place of business in New York, New York. GSC is a wholly owned subsidiary of GSG, and is the principal operating subsidiary of GSG. GSC is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

126. As used herein, the term "Goldman Sachs" includes Defendants GSG, GSC, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

127. During the relevant period, Goldman Sachs was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for

³⁷ Paritosh Bansal and Emily Flitter, *Deutsche fires three New York forex traders*, Reuters (Feb. 4, 2014), <https://www.reuters.com/article/us-deutschebank-forex/exclusive-deutsche-fires-three-new-york-forex-traders-source-idUSBREA131SP20140204>.

FX spot and forward transactions. For instance, in a Resolution Plan filed with the Federal Reserve Board, Goldman Sachs disclosed that it regularly uses futures, forwards, swaps, and options to “manage foreign currency exposure,” and described its operating entity J. Aron & Company as a “foreign exchange market maker.”³⁸ Goldman Sachs also consistently appears on *Euromoney’s* surveys of the top participants in the global FX market. And as noted above, GSC is a registered futures merchant and a clearing member of the CME.

128. Goldman Sachs entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. Goldman Sachs had extensive FX trading operations in the United States, including in New York. During the relevant period, Goldman Sachs had, within the United States and New York, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

129. In addition, many of Goldman Sachs’ collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. These collusive and manipulative acts harmed Goldman Sachs’ FX customers in the United States, as well as the broader FX market in the United States.

130. As detailed below, governmental regulators, including regulators in the United States, have specifically targeted Goldman Sachs as part of their ongoing investigations into the

³⁸ Goldman Sachs, *The Goldman Sachs Group, Inc. Global Resolution Plan* (Jun. 27, 2014), <http://www.federalreserve.gov/bankinfo/reg/resolution-plans/goldman-sachs-1g-20140701.pdf>.

manipulation of the FX market. Goldman Sachs has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.

131. ***HSBC Defendants.*** Defendant HSBC Holdings plc (“HSBC Holdings”) is a company organized and existing under the laws of the United Kingdom with its principal place of business in London, England. HSBC Holdings and its subsidiaries have substantial operations in the United States, including in New York.

132. Defendant HSBC Bank plc (“HSBC Bank”) is a company organized and existing under the laws of the United Kingdom with its principal place of business in London, England. HSBC Bank is a wholly owned subsidiary of HSBC Holdings. HSBC Bank and its subsidiaries have substantial banking operations in the United States, including in New York.

133. Defendant HSBC North America Holdings Inc. (“HSBC North America”) is a corporation organized and existing under the laws of Delaware with its principal place of business in New York, New York. HSBC North America is a wholly owned subsidiary of Defendant HSBC Holdings, and is the holding company for HSBC Holdings’s operations in the United States.

134. Defendant HSBC Bank USA, N.A. (“HSBC Bank USA”) is a federally chartered national banking association with its principal place of business in McLean, Virginia. HSBC Bank USA is a wholly owned subsidiary of Defendant HSBC Holdings. HSBC Bank USA has its principal executive office in New York, New York, and has branch offices throughout New York.

135. Defendant HSBC Securities (USA) Inc. (“HSBC Securities”) is a corporation organized and existing under the laws of Delaware with its principal place of business in New

York, New York. HSBC Securities is an indirect wholly owned subsidiary of HSBC Holdings. HSBC Securities is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

136. As used herein, the term “HSBC” includes Defendants HSBC Holdings, HSBC Bank, HSBC North America, HSBC Bank USA, HSBC Securities, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

137. During the relevant period, HSBC was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. In a Resolution Plan filed with the Federal Reserve Board, HSBC described its foreign exchange operations as a “core business line” that “provides services in foreign exchange (FX) spot, forwards, swaps and other related derivatives.”³⁹ HSBC also consistently appears on *Euromoney*’s surveys of the top participants in the global FX market. And as noted above, HSBC Securities is a registered futures merchant and a clearing member of the CME.

138. HSBC entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in this District. HSBC Holdings and HSBC Bank had extensive FX trading operations in the United States, including in New York, both directly and through their subsidiaries. For instance, HSBC’s foreign exchange trading website advertises that they provide “24-hour coverage” from their

³⁹ HSBC, *HSBC Holdings plc US Resolution Plan* (Jul. 1, 2014), <http://www.federalreserve.gov/bankinfo/resolution-plans/hsbc-2g-20140701.pdf>.

“three main centres in London, New York and Hong Kong.”⁴⁰ In an Order to Cease and Desist, the Federal Reserve Board detailed how HSBC Holdings “conducts operations in the United States through” its holding companies, including specifically as to FX, describing how the foreign bank, “through various subsidiaries . . . serves as a foreign exchange [] dealer, both in the United States and in its offices abroad, by buying and selling U.S. by buying and selling U.S. dollars and foreign currency for its own account and by soliciting and receiving orders through communications between customers and sales personnel that are executed in the spot market.”⁴¹ HSBC North America, HSBC Bank USA, and HSBC Securities also had significant FX trading operations in the United States, including at its principal place of business in United States. During the relevant period, HSBC had, within the United States, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

139. In addition, many of HSBC’s collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. For instance, Mark Johnson who acted as HSBC’s global head of FX cash trading, and was responsible for supervising HSBC’s FX trading desks in both London and New York, was charged with multiple counts of wire fraud and conspiracy to commit wire fraud by the DOJ.⁴²

⁴⁰ HSBC, *Foreign Exchange Information*, <http://www.gbm.hsbc.com/solutions/markets/foreign-exchange>.

⁴¹ Order to Cease and Desist, *In the Matter of HSBC Holding PLC, et al.*, Dkt. No. 17-010 (Sept. 29, 2017), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20170929a1.pdf>.

⁴² See, e.g., Complaint, *U.S. v. Johnson*, 16-cr-457-NGG-1, Dkt. No. 9 (E.D.N.Y. Aug. 16, 2016).

In a Notice of Suspension and Prohibition against Mr. Johnson and a second HSBC Trader, the Federal Reserve Board noted that the activity for which those traders were indicted “occurred, in part, in New York, New York.”⁴³ The Notice also explained that “Respondent Johnson supervised execution of the FX transaction while in New York using the assistance of HBUS’s FX trading facilities.”⁴⁴ These collusive and manipulative acts harmed HSBC’s FX customers in the United States, as well as the broader FX market in the United States.

140. As further detailed below, governmental regulators, including regulators in the United States, have specifically targeted HSBC as part of their ongoing investigations into the manipulation of the FX market. HSBC has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.

141. ***JPMorgan Defendants.*** Defendant J.P. Morgan Chase & Co. (“JPMC”) is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business in New York, New York. On May 29, 2008, JPMC merged with Bear Stearns & Co., assuming its assets and liabilities. Before the acquisition, Bear Stearns & Co. was a foreign exchange dealer and acted as a counterparty in foreign exchange transactions.

142. Defendant J.P. Morgan Chase Bank, N.A. (“JPMCB”) is a federally chartered national banking association with its principal place of business in New York, New York. JPMCB is a wholly owned subsidiary of JPMC.

143. Defendant J.P. Morgan Securities LLC (“JPMS”) is a limited liability company organized and existing under the laws of the State of Delaware, with its principal place of

⁴³ Notice of Suspension and Prohibition at 1-2, *In the Matter of Mark Johnson and Stuart Scott* (Oct. 5, 2016), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20161006a1.pdf>.

⁴⁴ *Id.* at ¶ 11.

business in New York, New York. JPMS and is an indirect wholly owned subsidiary of JPMC. JPMS is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

144. As used herein, the term “JPMorgan” includes Defendants JPMC, JPMCB, JPMS, and their subsidiaries and affiliates, including Bear Stearns & Co., that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

145. During the relevant period, JPMorgan was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For instance, in a Resolution Plan filed with Federal Reserve Board, JPMorgan disclosed that its “[c]ustomers use derivatives to mitigate or modify . . . foreign exchange . . . risks” and that “the Firm actively manages the risks from its exposure to these derivatives by entering into other derivative transactions.”⁴⁵ JPMorgan confirmed that “foreign exchange forward contracts are used to manage the foreign exchange risk,” and that the firm “enters into, as principal, certain exchange traded derivatives . . . such as futures and options.” JPMorgan further disclosed that the notional amount of its FX contracts in 2013 was over \$8.5 trillion, including over \$3.7 trillion in FX spot, futures, and forward transactions.

146. JPMorgan also consistently appears on *Euromoney*’s surveys of the top participants in the global FX market. In its Consent Orders on JPMorgan, the OCC observed that JPMorgan “engages in foreign exchange business (including G10 and other currencies, sales and trading in spot, forwards, options, or other derivatives)” and “was an active dealer in G10 spot foreign exchange market.” And as noted above, JPMS is a registered futures merchant and a clearing member of the CME.

⁴⁵ JPMorgan, *JPMorgan Chase & Co. Resolution Plan* (Jul. 1, 2014), <http://www.federalreserve.gov/bankinfo/reg/resolution-plans/jpmorgan-chase-1g-20140701.pdf>.

147. JPMorgan entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. JPMorgan had extensive FX trading operations in the United States, including in New York. During the relevant period, JPMorgan had, within the United States and New York, billions of dollars' worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

148. In addition, many of JPMorgan's collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. These collusive and manipulative acts harmed JPMorgan's FX customers in the United States, as well as the broader FX market in the United States.

149. As detailed below, governmental regulators, including regulators in the United States, have specifically targeted JPMorgan as part of their ongoing investigations into the manipulation of the FX market. JPMorgan has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.⁴⁶

150. ***Morgan Stanley Defendants.*** Defendant Morgan Stanley ("MS") is a corporation organized and existing under the laws of Delaware with its principal place of business in New York, New York. MS is a financial holding company and global financial services firm.

⁴⁶ Gavin Finch and Suzi Ring, *JPMorgan Currency Trader Said to Be Suspended for Actions at RBS*, Bloomberg (Jan. 14, 2015), <http://www.bloomberg.com/news/articles/2015-01-14/jpmorgan-currency-trader-said-to-be-suspended-for-actions-at-rbs>.

151. Defendant Morgan Stanley & Co., LLC (“MSC”) is a limited liability company organized and existing under the laws of Delaware with its principal place of business in New York, New York. MSC is a wholly owned subsidiary of Morgan Stanley. MSC is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

152. Defendant Morgan Stanley & Co. International plc (“MSI”) is a United Kingdom public limited company with headquarters in London, England.

153. As used herein, the term “Morgan Stanley” includes Defendant MS, MSC, MSI, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

154. During the relevant period, Morgan Stanley was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For instance, in a Resolution Plan filed with the FDIC, Morgan Stanley identified its FX operations as a “core business line,” which “provides execution in spot, forward, and derivative currency markets to government and institutional clients.”⁴⁷ Morgan Stanley also consistently appears on *Euromoney’s* surveys of the top participants in the global FX market. And as noted above, MSC is a registered futures merchant and a clearing member of the CME.

155. Morgan Stanley entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. Morgan Stanley had extensive FX trading operations in the United States, including in New York. During the relevant period, Morgan Stanley had, within the

⁴⁷ Morgan Stanley, *Morgan Stanley Resolution Plan* (Jul. 1, 2014), <https://www.fdic.gov/regulations/reform/resplans/plans/morgan-165-7114.pdf>.

United States and New York, billions of dollars' worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

156. In addition, many of Morgan Stanley's collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. These collusive and manipulative acts harmed Morgan Stanley's FX customers in the United States, as well as the broader FX market in the United States.

157. As detailed below, governmental regulators, including regulators in the United States, have specifically targeted Morgan Stanley as part of their ongoing investigations into the manipulation of the FX market. Morgan Stanley has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.

158. ***RBC Defendants.*** Defendant The Royal Bank of Canada is a company organized and existing under the laws of Canada with its principal place of business in Toronto, Canada. The Royal Bank of Canada has substantial operations in the United States, including in New York. The Royal Bank of Canada is a registered foreign bank with the New York Fed with assets of over \$100 billion in the United States. The Royal Bank of Canada is a registered broker-dealer with the SEC, a Futures Commission Merchant with the CFTC, registered with FINRA, and licensed by the New York Department of Financial Services. The Royal Bank of Canada has nine branch offices in the United States, three of which are located in New York. Each of The Royal Bank of Canada's New York locations are licensed and supervised as federal

branches by the OCC.⁴⁸ The Royal Bank of Canada's stock is listed on the New York Stock Exchange, and at least three members of The Royal Bank of Canada's Board of Directors reside in New York. The Royal Bank of Canada and its subsidiaries employ approximately 8,000 individuals in the United States. The Royal Bank of Canada has reported that its mission in the United States is "to be the preferred partner to corporate, institutional and high net worth clients and their businesses," and in 2016, 22% of The Royal Bank of Canada's revenue came from operations in the United States.⁴⁹

159. RBC Capital Markets LLC ("RBCCM") is a business segment of RBC incorporated in the United States, with its principal place of business and headquarters located in New York, New York. Prior to 2010, RBCCM was known as RBC Capital Markets Corporation, which was also a U.S. corporation headquartered in New York, New York.

160. As used herein, the term "RBC" includes Defendant The Royal Bank of Canada, RBCCM, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

161. During the relevant period, Defendant RBC was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For example, on its website, RBC describes itself as "an active market maker in spot, forward, swap, and option products."⁵⁰ Additionally, RBC mentions on its website that it offers "flexible and robust e-trading solutions" for its clients FX-

⁴⁸ Royal Bank of Canada, *Form 40-F*, at 7 (Nov. 30, 2016).

⁴⁹ Royal Bank of Canada, *Annual Report 2016*, at 1-2 (2016).

⁵⁰ RBC Capital Markets, *Foreign Exchange Expertise*, <https://www.rbccm.com/en/expertise/foreign-exchange.page>.

trading needs.⁵¹

162. RBC entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. The Royal Bank of Canada had extensive FX trading operations in the United States, including in New York, both directly and through its subsidiaries. For instance, in its U.S. Resolution Plan for 2013, The Royal Bank of Canada stated that it “provides corporate banking services to companies primarily located in the United states, including [] foreign exchange,” from its New York branch, “[u]nder the RBC Capital Markets brand name.”⁵² RBC’s online marketing materials further demonstrate that RBC has FX traders, including a Director of eFX sales, located at offices in New York, New York.⁵³ RBCCM also had significant FX trading operations in the United States, including at its principal place of business in New York, New York. During the relevant period, RBC had, within the United States and New York, billions of dollars’ worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

163. In addition, many of RBC’s collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. These

⁵¹ *Id.*

⁵² RBC, *U.S Resolution Plan* (Dec. 2013), <https://www.fdic.gov/regulations/reform/resplans/plans/rbc-165-1312.pdf>.

⁵³ RBC, *Foreign Exchange Execution Strategies*, <https://www.rbccm.com/assets/rbccm/docs/expertise/electronic/efx-algo-overview.pdf>.

collusive and manipulative acts harmed RBC's FX customers in the United States, as well as the broader FX market in the United States.

164. **RBS Defendants.** Defendant Royal Bank of Scotland plc ("RBS plc") is a corporation organized and existing under the laws of the United Kingdom with its principal place of business in Edinburgh, Scotland. RBS plc is a wholly owned subsidiary of RBS Group, and is the primary operating bank and subsidiary of RBS Group. RBS plc has substantial operations in the United States, including in New York. RBS plc has branches in the United States, including in New York, and has a registered office in New York. RBS plc is also a member of the CME and ICE.

165. Defendant NatWest Markets Securities Inc., formerly RBS Securities, Inc. ("NatWest"), is a corporation organized and existing under the laws of Delaware, with its principal places of business in Stamford, Connecticut. NatWest is a wholly owned subsidiary of RBS Group, and is RBS Group's primary US broker-dealer. NatWest is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing. NatWest engages in substantial trading activities in New York.

166. As used herein, the term "RBS" includes Defendants RBS plc, NatWest, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

167. During the relevant period, RBS was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For instance, RBS consistently appears on *Euromoney's* surveys of the top participants in the global FX market. In its 2013 Annual Report, RBS stated that its "FX Options benefitted from opportunities in volatile FX and emerging markets," and that its spot FX

business “minimized the impact” of weak currency volumes.⁵⁴ In addition, NatWest’s FINRA registration specifies that it “engages in swaps and foreign exchange brokerage,” and as noted above, NatWest is a registered futures merchant and a clearing member of the CME.

168. RBS entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. RBS plc had extensive FX trading operations in the United States, including in New York, both directly and through their subsidiaries. For instance, in an Order to Cease and Desist, the Federal Reserve Board described how RBS plc “conducts operations in the United States” through its holding companies, including specifically as to FX, describing how the foreign bank “serves as a foreign exchange [] dealer, both in the United States and in its offices abroad, by buying and selling U.S. by buying and selling U.S. dollars and foreign currency for its own account and by soliciting and receiving orders through communications between customers and sales personnel that are executed in the spot market.”⁵⁵ Similarly, in a criminal Plea Agreement with the DOJ, RBS plc admitted that it acted as an FX dealer in the United States and that they “purchased and sold substantial quantities of the EUR/USD currency pair in a continuous and uninterrupted flow of interstate and U.S. important trade and commerce to customers and counterparties located in U.S. states other than the U.S. states or foreign countries in which the defendant agreed to purchase or sell these currencies.”⁵⁶ NatWest also had significant FX trading operations in the United States, including at its principal place of business in the United States. During the

⁵⁴ RBS, *Annual Report and Accounts 2013*, <http://www.investors.rbs.com/~media/Files/R/RBS-IR/2013-reports/annual-report-and-accounts-2013.pdf>.

⁵⁵ Order to Cease and Desist, *In the Matter of The Royal Bank of Scotland PLC, et al.*, Dkt. No. 15-007 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a4.pdf>.

⁵⁶ Plea Agreement at ¶ 4(b)(j), *U.S. v. The Royal Bank of Scotland PLC* (May 20, 2015), <https://www.justice.gov/atr/file/838541/download>.

relevant period, RBS had, within the United States, billions of dollars' worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

169. In addition, many of RBS' collusive and manipulative acts took place, in substantial part, throughout the United States. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States, and manipulative FX transactions that were entered in the United States. For instance, in its criminal Plea Agreement with the DOJ, RBS plc admitted that many of its "[a]cts in furtherance of the charged offense were carried out within the District of Connecticut and elsewhere."⁵⁷ RBS further admitted to the DOJ that "[t]he business activities of the defendant and its co-conspirators in connection with the purchase and sale of the EUR/USD currency pair, were the subject of this conspiracy and were within the flow of, and substantially affected, interstate and U.S. important trade and commerce. The conspiracy had a direct effect on trade and commerce within the United States, as well as on U.S. import trade and commerce, and was carried out, in part, within the United States."⁵⁸ Similarly, the Federal Reserve Bank of Boston conducted a "supervisory review of the compliance and control infrastructure governing RBS's FX trading in the United States and identified certain areas for further improvement in RBS's compliance and control infrastructure relating to its FX businesses."⁵⁹ These collusive and manipulative acts harmed RBS' FX customers in the United States, as well as the broader FX market in the United States.

⁵⁷ *Id.* at ¶ 4(k).

⁵⁸ *Id.* at ¶ 4(b)(j).

⁵⁹ Order to Cease and Desist, *In the Matter of The Royal Bank of Scotland PLC, et al.*, Dkt. No. 15-007 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a4.pdf>.

170. As further detailed below, governmental regulators, including regulators in the United States, have specifically targeted RBS as part of their ongoing investigations into the manipulation of the FX market. RBS has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.⁶⁰

171. **SG Defendants.** Defendant Société Générale S.A. is a financial institution organized and existing under the laws of France, with its principal place of business in Paris, France. Société Générale has branches and representative offices throughout the United States, including its U.S. headquarters located in New York, New York. Société Générale is a registered foreign bank with the New York Department of Financial Services. Additionally, Société Générale offers FX trading services to clients across the globe through an electronic trading platform, known as “E-Foreign Exchange” or “E-FX.” Société Générale is a registered foreign bank with the New York Fed and holds over \$87 billion in assets in the United States, with all of those assets held in New York.

172. SG Americas Securities, LLC (“SGAS”) is a limited liability company organized and existing under the laws of Delaware, with its principal place of business in New York, New York. SGAS is a wholly owned subsidiary of Société Générale. SGAS is a registered broker with the SEC, a Futures Commission Merchant with the CFTC, and is registered with FINRA.

173. As used herein, the term “SG” includes Defendants Société Générale S.A., SGAS, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

⁶⁰ Russell Cheyne, *Six RBS traders could be punished in forex probe*, Reuters (Dec. 23, 2014), <https://uk.reuters.com/article/uk-rbs-forex-probe/six-rbs-traders-could-be-punished-in-forex-probe-idUKKBN0K116420141223>.

174. During the relevant period, SG was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. SG offers clients foreign exchange products through its Corporate and Investment Banking business segment. SG describes itself on the part of its website that describes its foreign exchange products as “top 10 player in G10 currencies.” SG consistently appears at the top of *Euromoney*’s surveys of the top participants in the global FX market.

175. SG entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. Société Générale had extensive FX trading operations in the United States, including in New York, both directly and through its subsidiaries. For instance, the Société Générale North America website states that the company “offers a full range of services,” including “corporate and investment banking,” which lists “forex” as one of the services that the bank provides “in the United States” where it “employs over 1,700 employees in eight cities.”⁶¹ Many high level FX personnel were located at Société Générale’s New York branch, including the former head of FX options trading at Société Générale, Bart Brooks.⁶² In a December 2013 Report of Assets and Liabilities filed with the FFIEC, Société Générale reported for its New York alone outstanding FX transactions of over \$21.6 billion.⁶³ SGAS also had significant FX trading operations in the United States, including at its principal place of business in New York, New York. During the

⁶¹ Société Générale North America, *Solutions For Our Clients*, <https://americas.societegenerale.com/en/solutions-for-our-clients/>; Société Générale North America, *Corporate & Investment Banking*, <https://americas.societegenerale.com/en/solutions-for-our-clients/corporate-investment-banking/>.

⁶² Miriam Siers, *Brooks departs Société Générale in New York*, FX Week (Feb. 28, 2011), <https://www.fxweek.com/fx-week/news/2028898/brooks-departs-societe-generale-york>.

⁶³ FFIEC, *Report of Assets and Liabilities of U.S. Branches and Agencies of Foreign Banks* (Dec. 31, 2013), https://www.ffiec.gov/nicpubweb/nicweb/InstitutionProfile.aspx?parID_Rssd=444819&parDT_END=20051231.

relevant period, SG had, within the United States and New York, billions of dollars' worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

176. In addition, many of SG's collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New York, and manipulative FX transactions that were entered in the United States and New York. These collusive and manipulative acts harmed SG's FX customers in the United States, as well as the broader FX market in the United States.

177. As detailed below, governmental regulators, including regulators in the United States, have specifically targeted SG as part of their ongoing investigations into the manipulation of the FX market. SG has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.⁶⁴

178. Government regulators have specifically targeted SG as part of their ongoing investigations into the manipulation of the FX market. As detailed below, SG has since suspended or terminated FX employees, including employees operating or based in the United States.

179. ***Standard Chartered Defendants.*** Standard Chartered Bank ("SC") is a limited liability company organized and existing under the laws of England and Wales, with its principal place of business in London. SC engages in substantial activities in the United States, including

⁶⁴ Karen Freifeld, *NY financial regulator subpoenas banks in forex probe*, Reuters (Feb. 10, 2015), <http://www.reuters.com/article/2015/02/10/usa-banks-probes-idUSL4N0VK61V20150210>.

in New York. SC has branches and representative offices throughout the United States, including in New York. SC has its U.S. headquarters, and thousands of employees, in New York, New York. SC is a registered foreign bank with the New York Fed with assets in the United States totaling over \$47 billion and 99% of those assets held in New York, New York. SC is also a registered Futures Commission Merchant with the CFTC, and a registered foreign bank with the New York Department of Financial Services.

180. Defendant Standard Chartered Securities (North America), Inc. (“SCS”) is a corporation organized and existing under the laws of Delaware, with its principal place of business in New York, New York. SCS is a wholly owned subsidiary of SC.

181. As used herein, the term “Standard Chartered” includes Defendants SC, SCS, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

182. During the relevant period, Standard Chartered was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For example, on its website, Standard Chartered stated that it is “one of the world’s leading banks in foreign exchange . . . operations” and “a leader in a wide range of major currencies and other emerging markets, for both spot and forward rates.”⁶⁵ Standard Chartered also highlighted that customers were able to engage in FX transactions through an electronic trading system known as Straight2Bank Exchange.

183. Standard Chartered entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. SC had extensive FX trading operations in the United States, including

⁶⁵ Standard Chartered, *Global Markets*, https://www.sc.com/lb/gmkts/gmkts_main.html.

in New York, both directly and through its subsidiaries. For instance, SC's financial markets website touts the bank's "presence in major hubs" including the United States, which serve a "comprehensive range of asset classes," including "foreign exchange."⁶⁶ SC's United States website in turn states that it provides full financial markets services in the United States, and links back to the aforementioned financial markets website listing foreign exchange as one of those services provided.⁶⁷ In a December 2013 Report of Assets and Liabilities filed with the FFIEC, SC reported for its New York branch alone outstanding FX transactions of over \$143.3 billion.⁶⁸ SC also acknowledged, in a Order by the New York DFS, that its New York branch is the headquarters for its Americas business, and "conducts a U.S. dollar clearing business," which includes trading FX instruments.⁶⁹ SCS also had significant FX trading operations in the United States, including at its principal place of business in New York, New York. During the relevant period, Standard Chartered had, within the United States and New York, billions of dollars' worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

184. In addition, many of Standard Chartered's collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United States and New

⁶⁶ Standard Chartered, *Banking*, <https://www.sc.com/en/banking/banking-for-companies/financial-markets/>.

⁶⁷ Standard Chartered, *United States: About Us*, <https://www.sc.com/us/about-us/>.

⁶⁸ FFIEC, *Report of Assets and Liabilities of U.S. Branches and Agencies of Foreign Banks* (Dec. 31, 2013), https://www.ffiec.gov/nicpubweb/nicweb/InstitutionProfile.aspx?parID_Rssd=444819&parDT_END=20051231.

⁶⁹ Order, at ¶ 11, *In the Matter of Standard Chartered Bank, et al.* (Aug 6, 2012), <http://dfs.ny.gov/about/ea/ea120806.pdf>.

York, and manipulative FX transactions that were entered in the United States and New York. These collusive and manipulative acts harmed SC's FX customers in the United States, as well as the broader FX market in the United States.

185. As detailed below, governmental regulators, including regulators in the United States, have specifically targeted SC as part of their ongoing investigations into the manipulation of the FX market. SC has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.

186. ***UBS Defendants.*** Defendant UBS AG is a financial institution organized and existing under the laws of Switzerland, with its principal places of business in Basel and Zurich, Switzerland. UBS AG engages in substantial activities in the United States, including in New York. UBS AG has branches and representative offices throughout the United States, including in New York. UBS AG has its U.S. headquarters, and thousands of employees, in New York, New York. UBS Group AG is a Swiss global financial services company, incorporated in the Canton of Zurich, and co-headquartered in Zürich and Basel.

187. UBS Securities LLC ("UBS Securities") is a limited liability company organized and existing under the laws of Delaware, with its principal place of business in New York, New York. UBS Securities is an indirect wholly owned subsidiary of UBS AG. UBS Securities is registered as a broker-dealer with the SEC, registered as a futures merchant with the CFTC, and is a clearing firm member of CME Clearing.

188. As used herein, the term "UBS" includes Defendants UBS AG, UBS Group AG, UBS Securities, and their subsidiaries and affiliates that bought, sold, settled, or otherwise transacted in FX instruments during the relevant period.

189. During the relevant period, UBS was a major participant in the FX market (including by transacting in spots, forwards, futures, and options), and a major dealer for FX spot and forward transactions. For instance, in a Resolution Plan filed with the Federal Reserve Board, UBS listed its foreign exchange franchise as a “core business line,” and confirmed that the bank’s FX contracts “include spot, forward and cross-currency swaps and options and warrants.”⁷⁰ UBS also consistently appears toward the top of *Euromoney*’s surveys of the top participants in the global FX market. In its Report on UBS’s manipulation of the FX market, FINMA stated that UBS was one of the banks that “dominated” the FX market, with an average market share of 8.9% between 2010 and 2013. And as noted above, UBS Securities is a registered futures merchant and a clearing member of the CME.

190. UBS entered into FX transactions and committed overt acts in furtherance of the conspiracy to manipulate the FX market throughout the United States, including in New York. UBS AG had extensive FX operations in the United States, including in New York, both directly and through its subsidiaries. For instance, in an Order to Cease and Desist, the Federal Reserve Board described how UBS AG “conducts operations in the United States” through its Connecticut branch, including specifically as to FX, describing how the foreign bank “serves as a foreign exchange [] dealer, both in the United States and in its offices abroad, by buying and selling U.S. by buying and selling U.S. dollars and foreign currency for its own account and by soliciting and receiving orders through communications between customers and sales personnel that are executed in the spot market.”⁷¹ In a December 2013 Report of Assets and Liabilities filed with the FFIEC, UBS AG reported for its New York branch, outstanding FX transactions of

⁷⁰ UBS, 2014 UBS US Resolution Plan (Jul. 2014), <http://www.federalreserve.gov/bankinforeg/resolution-plans/ubs-1g-20140701.pdf>.

⁷¹ Order to Cease and Desist, *In the Matter of UBS AG, et al.*, Dkt. No. 15-005 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a6.pdf>.

over \$3.7 billion,⁷² and for its Connecticut branch, outstanding FX transactions of over \$361 billion.⁷³ UBS Securities also had significant FX trading operations in the United States, including at its principal place of business in the United States. During the relevant period, UBS had, within the United States and New York, billions of dollars' worth of FX instruments outstanding each day, including extensive transactions directly with Plaintiffs.

191. In addition, many of UBS' collusive and manipulative acts took place, in substantial part, throughout the United States, including in New York. Those overt acts include, but are not limited to, conspiratorial communications (including via electronic chats, phone calls and messages, and in-person meetings) that occurred in the United and manipulative FX transactions that were entered in the United States. For instance, in its criminal Plea Agreement with the DOJ, UBS AG admitted that "its FX traders, conspired with other financial services firms acting as dealers in an FX spot market by agreeing to restrain competition in the purchase and sale of the EUR/USD currency pair in the United States and elsewhere."⁷⁴ UBS further admitted to the DOJ that certain collusive and manipulative "practices occurred on UBS's FX sales and trading desks in Zurich, London (sales only), and Stamford."⁷⁵ Similarly, the CFTC found that "UBS traders' attempts to manipulate certain FX benchmark rates . . . involved desks and offices located in at least Stamford, Connecticut, and Zurich, Switzerland."⁷⁶ These

⁷² FFIEC, *Report of Assets and Liabilities of U.S. Branches and Agencies of Foreign Banks* (Dec. 31, 2013), https://www.ffiec.gov/nicpubweb/nicweb/InstitutionProfile.aspx?parID_Rssd=444819&parDT_END=20051231.

⁷³ *Id.*

⁷⁴ Order Instituting Proceedings, *In the Matter of UBS AG*, CFTC Dkt. No. 15-06 (Nov. 11, 2014), <https://www.cftc.gov/sites/default/files/idc/groups/public/@lrenforcementactions/documents/legalpleading/enfubsorder111114.pdf>.

⁷⁵ Plea Agreement, *U.S. v. UBS AG* (May 20, 2015), <https://www.justice.gov/file/440521/download>.

⁷⁶ *Id.*

collusive and manipulative acts harmed UBS' FX customers in the United States, as well as the broader FX market in the United States.

192. As further detailed below, governmental regulators, including regulators in the United States, have specifically targeted UBS as part of their ongoing investigations into the manipulation of the FX market. UBS has since suspended or terminated FX employees, including employees operating or based in the United States, and banned the use of multi-bank chat rooms by its FX personnel.⁷⁷

193. Various other entities and individuals unknown to Plaintiffs at this time participated as co-conspirators in the acts complained of, and performed acts and made statements that aided and abetted and were in furtherance of, the unlawful conduct alleged herein. Defendants are jointly and severally liable for the acts of their co-conspirators whether named or not named as Defendants in this Complaint.

BACKGROUND

A. The FX Market Generally

194. Foreign exchange involves the buying and selling of currency, or the exchanging of one type of currency for another. The FX market is the largest in the financial system, with an estimated daily turnover of \$5.1 trillion in April 2016, \$5.3 trillion in April 2013, and \$4.0

⁷⁷ Emily Flitter and Jamie McGeever, *UBS suspends U.S.-based forex trader in manipulation probe*, Reuters (Mar. 28, 2014), <https://www.reuters.com/article/us-forexubs-investigation/ubs-suspends-u-s-based-forex-trader-in-manipulation-probe-idUSBREA2R1BL20140328>.

trillion in April 2010.⁷⁸ FX trading in the United States alone averaged \$1.273 trillion per day in April 2016, \$1.263 trillion per day in April 2013, and \$864 billion per day in April 2010.⁷⁹

195. Currencies are traded in pairs. The top three currency pairs are Euro/U.S. dollar (“EUR/USD”), Japanese Yen/U.S. dollar (“JPY/USD”), and British pound/U.S. dollar (“GBP/USD”), which together account for over half of all FX market turnover globally. In April 2013, the U.S. dollar was on one side of 87% of all FX transactions globally. Beyond these top currency pairs, transactions involving hundreds of other currencies occur on the FX market.

196. The main types of trades in the FX market are spot, forwards, options, and futures transactions. A spot transaction is the exchange of two currencies between counterparties at an agreed-to rate for immediate delivery. A forward contract, like a spot transaction, also involves the exchange of two currencies between counterparties at an agreed-to rate at the time of the contract, but with delivery at some time in the future.

197. There are two main types of FX options transactions: puts and calls. Puts give the option holder the right, but not the obligation, to sell the underlying FX contract at a predetermined price (called the strike price). Conversely, calls give the option holder the right, but not the obligation, to buy the underlying FX contract at the strike price. In either case, the option buyer pays a negotiated price, or premium, to the option seller. If the option contract is exercised, the buyer of the call or seller of the put establishes a position in a currency contract.

⁷⁸ Bank of International Settlements, *Triennial Central Bank Survey* (Sept. 2016), <http://www.bis.org/publ/rpfx16fx.pdf>.

⁷⁹ NY Fed, *The Foreign Exchange and Interest Rate Derivatives Markets: Turnover in the United States, April 2016* (Sept. 2016), <https://www.newyorkfed.org/medialibrary/media/markets/pdf/2016triennialreport.pdf>.

198. Trading of FX spots, forwards, and options is largely done over-the-counter (“OTC”), meaning that there is no centralized exchange and that a customer must utilize a dealer, such as one of the Defendants.

199. An FX futures contract is an agreement to buy or sell currency at a set price and date in the future. Futures differ from forwards in that they are largely traded on centralized exchanges—such as the Chicago Mercantile Exchange (“CME”) and the ICE Futures U.S. Exchanges (“ICE”)—and are cleared through a central clearinghouse, which acts as the buyer to every seller and the seller to every buyer, rather than being transacted directly with the counterparty. Because they are exchange-traded, futures are highly standardized, whereas forwards and other OTC transactions are customized to the needs of the transaction participants. Options on FX futures give the holder the right, but not the obligation, to buy or sell an underlying FX futures contract at a certain price. FX futures and options on futures traded on the CME and ICE follow the exchange rates that are set in the spot market.

B. FX Bid/Ask Spreads

200. For FX spot, forward, and options traded over-the-counter, dealers (also called “market makers”) exist to provide liquidity and to ensure there is always a counterparty for any transaction. To initiate an FX OTC transaction, a customer contacts a dealer indicating the currency and quantity she wishes to trade, and inquires as to the price. The dealer states the prices at which it is willing to buy (the “bid”) and sell (the “ask”). The customer then decides whether to buy, sell, or pass. The dealer is compensated for its services by way of the gap between the quoted buy and sell prices, or the “bid/ask spread.”

201. Bid/ask spreads are the most visible way in which dealers, including Defendants, compete against each other. The spread functions effectively as a price; the wider the spread the more the client pays the dealer to complete the transaction. In fact, traders generally use the

terms “spread” and “price” interchangeably. Because currencies are fungible, customers may choose the dealer that they prefer entirely based on the price or spread at which that dealer will sell a currency. Customers will look for dealers who offer narrower spreads, or, in other words, dealers who will “sell” currency at a lower price. Thus, to be competitive in a marketplace, dealers must offer bid/ask spreads that approximate the bid/ask spreads offered by their competitors; dealers normally gain and lose market share based on whether the spreads they offer customers are lower or higher than the spreads offered by competitors.

202. Historically, and even today, FX OTC transactions are carried out by telephoning a salesperson or voice broker at a dealer bank, who receives the trade information, provides a bid and an ask price, and often completes the trade. Because FX salespeople have strong institutional relationships and keep track of clients’ order histories, they are often able to predict client trades even before an order is placed. Throughout the order process salespeople are in regular contact with traders. They inform the traders of incoming potential orders, confirm bid and ask prices, and ultimately convey placed orders to the trading desk for processing. Thus, generally salespeople are aware of all potential and pending trades that are processed through their desks.

C. FX Benchmark Rates

203. Although FX contracts may be entered into and executed at any time, investors often use what are called benchmark rates as the price in a transaction. FX benchmark rates are fixed rates that are published daily and generally calculated based on transactions that occur during a limited interval at a set time during the day. Investors often decide to tie an FX transaction to a benchmark rate in order to avoid poor or untimely execution of currency trades.

204. In a benchmark-linked transaction, the customer typically instructs a dealer to buy or sell currency at the benchmark rate; the dealer then guarantees the transaction at that fixed

rate. Because the order is for a future time, the parties are exposed to changes in the exchange rate. Once a customer places an order for currency at a fixed benchmark rate, the dealer must venture into the FX market to make a corresponding purchase or sale of currency to fulfill the order. If the price of the currency in the corresponding transaction differs from the benchmark rates, the dealer will make or lose money when it completes the order. Thus, dealers including the Defendants directly gain or lose profits based on changes in the benchmark rates.

1. The WM/Reuters Rate, and the importance of prices at 4 p.m. London time

205. The WM/Reuters rate is the most widely used benchmark in the FX market. At all relevant times, it was calculated by a joint venture between State Street Corp. (which owns World Markets Co. or “WM”) and Reuters,⁸⁰ based on actual trades in the FX market. Unlike some other financial benchmarks, WM/Reuters rates are merely median prices of all trades in a fixed period for currency pairs, and at all relevant times, were determined on a half-hourly, hourly, or end-of-day basis.

206. At all relevant times,⁸¹ a WM/Reuters rate was calculated using data from bids and offers and actual foreign exchange trades executed over a one-minute period (or two minutes for some currencies), lasting 30 seconds before to 30 seconds after the time of the rate calculation. According to State Street Corp.: “The process for capturing this information and

⁸⁰ In April 2016, Thomson Reuters acquired the WM/Reuters Benchmark from State Street Corporation. *See* Thomson Reuters Press Release, *Thomson Reuters Acquires WM/Reuters Foreign Exchange Benchmarks From State Street Corporation* (Apr. 4, 2016), <https://www.thomsonreuters.com/en/press-releases/2016/april/thomson-reuters-acquires-wmreuters-foreign-exchange-benchmarks-from-state-street-corporation.html>.

⁸¹ As of January 2017, spot rates are measured over a five minute window. *See* Thompson Reuters Benchmark Services Limited, *WM/Reuters FX Benchmarks Spot & Forward Rates Methodology Guide* at ¶¶ 2.4.1–2 (Jan. 2017), <http://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/financial/wm-reuters-methodology.pdf>.

calculating the spot fixings is automated and anonymous.”⁸² Using that data, a median bid and offer rate are calculated, and then a mid rate is calculated from these median bid and offer rates—that rate is the WM/Reuters rate for that hour. The median methodology employed by WM/Reuters takes no account of the size of the notional behind each quote, weighting all quotes equally.

207. The most widely used WM/Reuters rate is the WM/Reuters Closing Spot Rate, which is calculated around 4 p.m. London time (10 a.m. Central time). There is a WM/Reuters Closing Rate for every currency pair traded.

2. The ECB Rate, and the importance of prices at 1:15 p.m. London time

208. The European Central Bank (“ECB”) owns and operates other benchmark rates for more than 30 different currencies. These benchmark rates are published daily for currency pairs that are actively traded against the euro. At all relevant times, the ECB rate was the second most popular benchmark rate in the FX market, behind the WM/Reuters rate.⁸³ The ECB rate was used by many different participants across the FX market, in ways that paralleled the uses of the WM/Reuters benchmark.

209. The ECB published one benchmark rate for each currency pair. At all relevant times, the ECB rates were based on the regular daily spot FX trading by market participants at or around 1:15 p.m. London time.⁸⁴ In particular, the ECB rate reflects the currencies trades

⁸² Liam Vaughan, Gavin Finch, & Ambereen Choudhury, *Traders Said to Rig Currency Rates to Profit Off Clients*, Bloomberg (Jun. 12, 2013), <https://www.bloomberg.com/news/articles/2013-06-11/traders-said-to-rig-currency-rates-to-profit-off-clients>.

⁸³ The ECB now emphasizes that its rates are not to be used for transactions but only for information. See Marc Jones and Patrick Graham, *ECB shifts daily FX rates in anti-rigging move*, Reuters (Dec. 7, 2015), <http://www.reuters.com/article/us-europe-ecb-forex-idUSKBN0TQ1M620151207>.

⁸⁴ The ECB rates have been published around 3 p.m. London time since July 1, 2016, although the calculation methodology remains the same. See ECB Press Release, *ECB*

between central banks within the European System of Central Banks. The ECB is sometimes called a “flash” rate, as it reflects the average currency rate at a single moment in time.

3. Other benchmark rates

210. There are many other FX benchmark rates used throughout the world. For example, at all relevant times, the CME and the Trade Association for the Emerging Markets (“EMTA”) published a benchmark rate for Russian Ruble/U.S. Dollar currency trades (the “CME/EMTA Rate”). The CME/EMTA was based on bids and offers submitted by banks to the CME, and is the price used for calculation of the final settlement price at termination of the Russian Ruble/U.S. Dollar futures contract—a cash settled futures contract traded on the CME. The Association of Banks in Singapore also publishes a range of daily benchmark rates, based on transactions in various Asian currencies against the U.S. dollar. Those rates are based on submissions by a panel of banks at 11:00 a.m. each day.

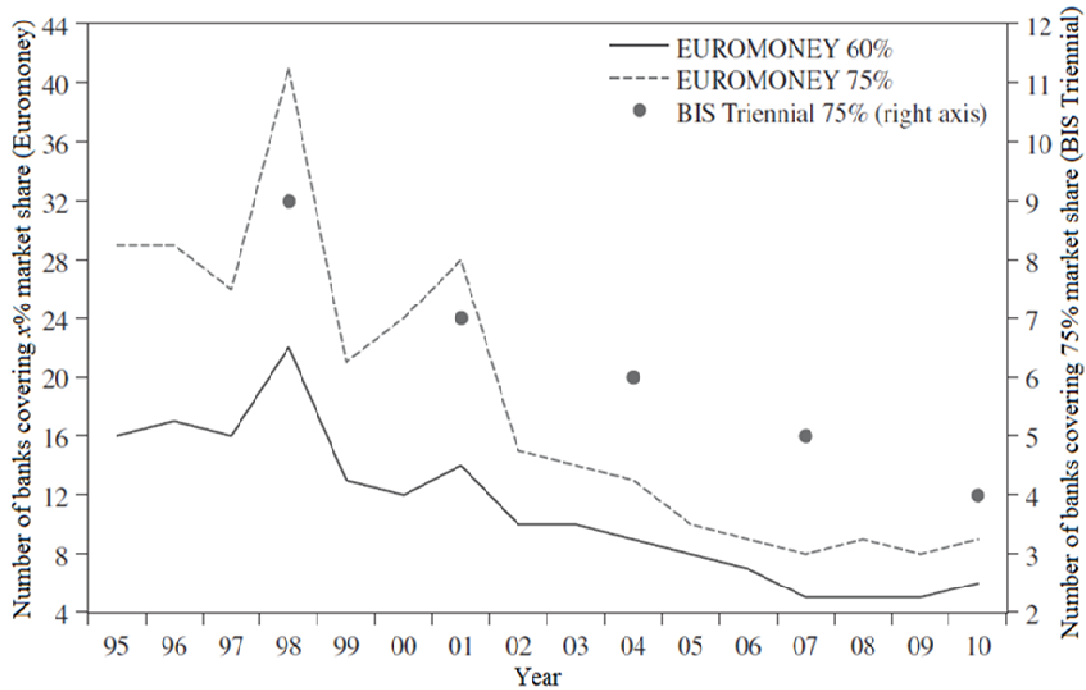
D. Increasing FX Market Consolidation

211. Beginning in the late 1990s, the FX market underwent consolidation that increased market share among a small number of dealers—predominantly, Defendants. The increased consolidation of the FX market coincided with the emergence of electronic trading platforms, including Barclays’ BARX, Deutsche Bank’s Autobahn, UBS’s FX Trader, and Citi’s Velocity, as a way to process FX transactions. As discussed below, these systems for electronic trading are often automated and very sophisticated; the power of this new technology can be harnessed to create opportunities for both buyers and dealers.

212. Because dealers were forced to invest heavily in electronic trading technology, smaller dealers have largely exited the FX market. This increased concentration facilitated the

introduces changes to euro foreign exchange reference rates (Dec. 7, 2015), <https://www.ecb.europa.eu/press/pr/date/2015/html/pr151207.en.html>.

collusion at issue in this Complaint. For instance, between 1998 and 2010, the market share of the top three dealers—each of them a Defendant—rose from 19% to 40%. That increased concentration of the FX market is summarized below.



213. Defendants took an even greater stranglehold over the FX market during the latter part of the relevant period. According to a survey by *Euromoney*, an industry publication, Defendants have held the top spots by market share, and have had an aggregate market share of *over 90%*. For example, Defendants' shares of the FX market in 2012 and 2013 are depicted below.

Defendant	2012 Market Share	2013 Market Share
Deutsche Bank	14.57%	15.18%
Citigroup	12.26%	14.90%
Barclays	10.95%	10.24%
UBS	10.48%	10.11%
HSBC	6.72%	6.93%
JP Morgan	6.60%	6.07%
RBS	5.86%	5.62%
Credit Suisse	4.68%	3.70%

Morgan Stanley	3.52%	3.15%
Goldman Sachs	3.12%	2.75%
BNP Paribas	2.63%	2.52%
Bank of America	2.41%	3.08%
Societe Generale	1.76%	1.57%
Standard Chartered	0.89%	0.91%
RBC	0.84%	0.88%
MUFG	0.24%	0.31%
Defendants' Aggregate Market Share	90.86%	90.92%

214. Defendants also dominate the U.S. spot market. For instance, the New York Fed reported that for every year from 2008 to 2013, the top ten banks engaged in over 90% of all spot volume in the United States.

215. As the market has become more concentrated, the population of FX traders at dealer banks has also shrunk. These traders receive bonuses tied to their individual profits and the profits of the entire trading floor. Since the financial crisis, there have been staff reductions and the FX trading desks—even at the largest banks, i.e., Defendants—are typically staffed with only eight to ten traders, many of whom have worked previously with their counterparts in other banks. Thus, the market is dominated by a handful of individuals, who often have strong social ties formed by working with each other at some point in the past. In fact, many of these traders live near each other, socialize together, belong to the same social clubs, and participate on the same professional committees.

216. The *Financial Times* reports that—in more than a dozen interviews—foreign exchange veterans and investors confessed that these changes in the structure of the Defendants' businesses and the small, close-knit exchange trader community have increased incentives and

opportunities for collusion.⁸⁵ As one former Citi banker noted, “This is a market in which price fixing and collusion could actually work.”⁸⁶

E. FX Futures Transactions

217. Unlike the over the counter process by which FX spot, forward, and options transactions are conducted, FX futures and options on futures are traded on exchanges like CME Globex and ICE Futures U.S. Exchange. FX futures, options on futures, and other FX exchange-traded derivatives comprise a sizable market of their own, with an estimated daily turnover of \$115 billion in April 2016, \$145 billion in April 2013, and \$145 billion in April 2010.⁸⁷ FX Futures contracts are subject to standardized terms and conditions that govern the currency pairs, the quantity of currency to be exchanged, and the delivery time and place. For example, FX futures generally call for delivery of a specified quantity of a specified currency, or a cash settlement, during the months of March, June, September, and December. The quarterly Settlement Date is the third Wednesday in March, June, September, and December, with trading ending on the second business day before the third Wednesday of the contract month (usually a Monday). The only term in an FX futures contract that is subject to variation is price.

218. Like futures, options on FX futures are also exchange-traded and are also highly standardized. Just as is the case with futures, price is the only competitive variable between options on futures contracts.

⁸⁵ Daniel Schäfer, Alice Ross, and Delphine Strauss, *Foreign exchange: The big fix*, Financial Times (Nov. 12, 2013), <http://www.ft.com/cms/s/2/7a9b85b4-4af8-11e3-8c4c-00144feabdc0.html#axzz3fnepy5Pj>.

⁸⁶ *Id.*

⁸⁷ Bank of International Settlements, *Triennial Central Bank Survey* (Sept. 2016), <http://www.bis.org/publ/rpfx16fx.pdf>.

1. FX futures prices move in tandem with FX spot prices

219. The prices for FX futures and options on futures are highly dependent upon, and move together with, the FX spot rate. That is because the FX spot rate is a major component of the fair value of FX futures contracts. Changes in spot prices will thus directly impact prices in corresponding futures. The value of options on FX futures, which are directly linked to the prices of the underlying futures contracts, are thus similarly dependent on the underlying spot prices. Numerous academic and authoritative sources have documented this relationship between spot prices and futures prices.⁸⁸

220. Indeed, in its Orders on Barclays, Citi, HSBC, JPMorgan, RBS, and UBS, the CFTC observed that “[e]xchange rates in many actively traded CME foreign exchange futures contracts, including the Euro/U.S. Dollar (EUR/USD) futures, the Japanese Yen/U.S. Dollar (JPY/USD) futures, and British Pound Sterling/U.S. Dollar (GBP/USD) futures, track rates in spot foreign exchange markets at near parity after adjusting for the forward differential, or adding or subtracting ‘forward points.’” The CFTC added that “FX benchmark rates, including the WM/Reuters Rates, are used to price a variety of transactions including foreign exchange swaps, cross currency swaps, spot transactions, forwards, options, futures, and other financial derivative instruments.”

221. Tracking the price movements for spot and futures transactions for six commonly traded currency pairs (AUD/USD, CAD/USD, CHF/USD, EUR/USD, GBP/USD, JPY/USD) further confirms that there is a near-perfect correlation between the futures and spot prices for those currency pairs. For instance, Plaintiffs tracked price movements for the EUR/USD

⁸⁸ See generally, e.g., John Labuszewski, Sandra Ro, and David Gibbs, CME Group, *Understanding FX Futures* (Apr. 22, 2013), <https://www.cmegroup.com/education/files/understanding-fx-futures.pdf>.

currency pair during the 2004 to 2014 time period. The analysis found a **99.98%** correlation between EUR/USD futures and spot prices, with the two moving so closely together throughout this period that they are nearly indiscernible. The same correlation (this time, **99.99%**) is seen in the GBP/USD currency pair. Once again, the futures and spot prices are indistinguishable, no matter how prices moved.

222. The immediate correlation between spot and futures prices did not just operate on a day-to-day basis, but in the minute-to-minute basis as well. For instance, Plaintiffs tracked the intra-day movements for AUD/USD spot and futures prices. In line with the discussion above, spot and futures prices moved together. And when there was a spike in the spot price right around the WM/Reuters Closing Rate fixing window, there was a spike in the futures price as well.

2. The CME Daily Settlement Rate, and the importance of prices at 2 p.m. Central time

223. Like other futures contracts, FX futures are secured by performance bonds that may be posted by both buyers and sellers. These performance bonds are also referred to as margin requirements, and are designed to anticipate, and secure against, the maximum anticipated one-day price movement. As set forth below, the day-to-day price movements (which determine how much margin must be posted) are calculated based on a snapshot of trading activity at a fixed time each day.

224. Positions in futures contracts are marked-to-market on a daily basis, and the corresponding profits and losses posted to, or deducted from, the trader's account. For FX futures, mark-to-market amounts are banked in cash every day, meaning that gains and losses in currency futures are realized daily. The mark-to-market amount of a given futures contract is determined by taking the end-of-day settlement price of the futures contract and subtracting the

previous day's end-of-day settlement price, and multiplying that figure (positive or negative) by the net position (positive for a net long position, negative for a net short position). The end of day settlement price is calculated based on the volume weighted average price of trades made over the thirty-second interval ending at 2 p.m. Central time, i.e., the CME Daily Settlement Rate fixing period.⁸⁹

225. The end of day settlement price is also used to determine which expiring options contracts are in the money and which are not. At the time of expiration (typically Fridays), CME uses the CME Daily Settlement Rate to force exercise of in the money options, and to force abandonment of out of the money options, for certain currencies in order to determine which FX futures contracts will be assigned to expiring options positions.

226. The most common way for an FX futures transaction to settle is for the trader to enter into an offsetting transaction in the same currency pair, amount, and maturity, leaving him with a flat position, which is equivalent to having no position at all.⁹⁰ When a futures contract is closed out in this way, the trader's account is credited or debited according to the value of the original contract at the time that position was closed. The final settlement price is determined by CME based on the trading prices in the relevant contract during the 30 second period between 9:15:30 a.m. and 9:16:00 a.m. Central time on the settlement date.

⁸⁹ The ICE FX futures exchange also uses prices around 2 p.m. Central time to perform similar calculations as done for futures on the CME exchange. Thus, all the allegations herein with respect to the CME Daily Settlement Rates are relevant to that exchange as well.

⁹⁰ This differs from forwards, where each forward contract is with a separate counterparty. In such case, entering into a second, offsetting transaction leaves the party with two sets of contractual rights and obligations, one for each of the forward contract counterparties. In contrast, because futures are transacted through a central clearinghouse that acts as buyer to every seller and seller to every buyer, an offsetting transaction leaves the trader flat vis-à-vis his central clearing counterparty, effectively canceling the original trade and locking in the profit or loss of that trade at the time of the second, offsetting transaction.

ADDITIONAL FACTUAL ALLEGATIONS

I. GOVERNMENT INVESTIGATIONS OF FX MANIPULATION AND THE RESULTING PURGE OF BANK EMPLOYEES AND BAN ON MULTI-BANK CHATROOMS

A. Overview of the Numerous FX Investigations

227. Beginning in 2013, media reports surfaced that government regulators and enforcement authorities were investigating Defendants' manipulation of the FX market. These investigations quickly grew in scope to include authorities from across the globe—including in the United States, United Kingdom, European Union, Switzerland, Germany, Hong Kong, Singapore, Australia, and New Zealand.

228. As detailed below, many of those investigations have already resulted in settlements and fines totaling over ***\$11 billion***, as well as the release of orders, notices, agreements, and reports detailing exactly how Defendants colluded to manipulate the FX market. Many of those and other government investigations are still ongoing, which on information and belief will yield similar results. The contents of the orders, notices, agreements, and reports resulting from governmental investigations of FX manipulation are hereby incorporated by reference in this Complaint.

1. The DOJ Plea Agreements with Barclays, BNP Paribas, Citi, JPMorgan, RBS, and UBS

229. Around the fall of 2013, the U.S. Department of Justice ("DOJ") Criminal and Antitrust Divisions launched broad civil and criminal investigations into Defendants' manipulation of the FX market. In an interview, then-U.S. Attorney General Eric Holder stated that "[w]e've recognized that this is an extremely consequential investigation," and that "[t]he

manipulation we've seen so far may just be the tip of the iceberg.”⁹¹ The then-Attorney General added that the DOJ was “taking a leading role” in this “truly global investigation.”

230. The DOJ specifically targeted these Defendants, including but not limited to Barclays, Citi, HSBC, JPMorgan, RBS, and UBS. Many of the banks were required to produce documents and information relating to their FX operations pursuant to deferred prosecution and non-prosecution agreements they entered with the DOJ in connection with its investigation into manipulation of the LIBOR benchmark interest rate. According to Mythili Raman, the then-acting head of the DOJ's criminal division, “[t]he cooperation we have been able to secure as part of our agreements in the Libor investigation has been very helpful to us in terms of holding banks' feet to the fire.”⁹² In addition, UBS approached the DOJ with incriminating documents relating to the FX probe in hope of gaining immunity or leniency from the DOJ's antitrust prosecutions as the “first firm to cooperate.”⁹³

231. The DOJ continued to press the Defendants for information on their FX operations. In July 2014, the Financial Times reported that the DOJ offered immunity deals to junior traders in London as they continued to investigate the rigging of FX rates by senior traders.⁹⁴ Then, around November 13, 2014, the DOJ reportedly gave the banks one month to

⁹¹ Ben Protess, Landon Thomas Jr., and Chad Bray, *U.S. Investigates Currency Trades by Major Banks*, N.Y. Times (Nov. 14, 2013), <http://dealbook.nytimes.com/2013/11/14/u-s-investigates-currency-trades-by-major-banks/>.

⁹² David McLaughlin and Tom Schoenberg, *Banks Aid U.S. Forex Probe, Fulfilling Libor Accords*, Bloomberg (Jan. 22, 2014), <http://www.bloomberg.com/news/articles/2014-01-23/banks-aid-u-s-forex-probe-fulfilling-libor-accords>.

⁹³ Jamie McGeever, *UBS seeks first-mover immunity in U.S. currency probe*, Reuters (Feb. 7, 2014), <http://www.reuters.com/article/2014/02/07/us-ubs-forex-idUSBREA161UN20140207>.

⁹⁴ Daniel Schäfer, Caroline Binham, and Kara Scannell, *Junior Traders Offered Immunity in Forex Probe*, Financial Times (July 13, 2014), <http://on.ft.com/2DaDP1P>.

provide a full accounting of any misconduct.⁹⁵ Then-Attorney General Eric Holder stated at that time that he expected the DOJ to conclude its investigation “relatively soon,” and would move toward civil and criminal resolutions.

232. Since that time, the DOJ’s investigation uncovered new avenues of potential manipulation, including reports that HSBC leaked confidential FX-related information to a major hedge fund.⁹⁶ By February 2015, the DOJ had reportedly grown more certain that they had evidence to support criminal charges of collusive conduct by Barclays, Citi, JPMorgan, and RBS in particular, and was insisting that those banks enter guilty pleas in order to settle the cases against them.⁹⁷ In March 2015, the DOJ was reported to be seeking \$1 billion each from the banks that it was investigating.⁹⁸ The DOJ also confirmed that it was preparing cases against individual current and former employees of the banks.

233. On May 20, 2015, the DOJ announced the first formal results of its investigations—felony guilty pleas entered by Defendants Barclays, Citi, JPMorgan, RBS, and

⁹⁵ David McLaughlin, *U.S. Said to Give Banks December Deadline in FX Probe*, Bloomberg (Nov. 13, 2014), <http://www.bloomberg.com/news/articles/2014-11-13/u-s-said-to-give-banks-december-deadline-in-fx-probe>.

⁹⁶ Katie Martin, Chiara Albanese, and David Enrich, *Justice Department Investigating Possible HSBC Leak to Hedge Fund*, Wall St. J. (Nov. 25, 2014), <http://www.wsj.com/articles/justice-department-investigating-possible-hsbc-leak-to-hedge-fund-1416953090>.

⁹⁷ Davlin Barrett and Christopher Matthews, *U.S. Seeks Guilty Pleas From 4 Banks in Currency Antitrust Probe*, Wall St. J. (Feb. 10, 2015), <http://www.wsj.com/articles/u-s-seeks-guilty-pleas-from-4-banks-in-currency-antitrust-probe-1423616204>; Ben Protess and Jessica Silver-Greenberg, *Justice Department Is Seeking Felony Pleas by Big Banks in Foreign Currency Inquiry*, N.Y. Times (Feb. 9, 2015), http://dealbook.nytimes.com/2015/02/09/u-s-is-seeking-felony-pleas-by-big-banks-in-foreign-currency-inquiry/?_r=0.

⁹⁸ Keri Geiger and Greg Farrell, *U.S. Is Seeking Billions From Global Banks in Currency Manipulation Settlement*, Bloomberg (Mar. 13, 2015), <http://www.bloomberg.com/news/articles/2015-03-13/u-s-said-to-start-at-1b-a-bank-to-settle-currency-probe>.

UBS.⁹⁹ Those Defendants also agreed to pay massive criminal fines: \$925 million for Citi, \$650 million for Barclays, \$550 million for JPMorgan, \$395 million for RBS, and \$203 million for UBS.

234. Barclays, Citi, JPMorgan, and RBS each pleaded guilty to conspiring to manipulate prices for U.S. Dollars and Euros exchanged in the FX market. Specifically, the DOJ found that those four Defendants “entered into and engaged in a conspiracy to fix, stabilize, maintain, increase or decrease the price of, and rig bids for, the EUR/USD currency pair exchange in the FX Spot Market by agreeing to eliminate competition in the purchase and sale of the EUR/USD currency pair in the United States and elsewhere.”¹⁰⁰ The conspiracy was carried out in electronic chat rooms, such as “The Cartel” and “The Mafia,” by “various means and methods, including . . . coordinating the trading of the EUR/USD currency pair in connection with European Central Bank and World Markets/Reuters benchmark currency fixes which occurred at 2:15 PM (CET) and 4:00 PM (GMT) . . . and refraining from certain trading behavior, by withholding bids and offers, when one conspirator held an open risk position, so that the price of the currency traded would not move in a direction adverse to the conspirator with an open risk position.” The DOJ found that the conspiracy had a direct effect on trade and commerce within the United States, as well as on U.S. import trade and commerce, and was carried out, in part, within the United States.

⁹⁹ DOJ Press Release, *Five Major Banks Agree to Parent-Level Guilty Pleas* (May 20, 2015), <http://www.justice.gov/opa/pr/five-major-banks-agree-parent-level-guilty-pleas>.

¹⁰⁰ Plea Agreement, *U.S. v. Barclays PLC* (D. Conn. May 20, 2015), <http://www.justice.gov/file/440481/download>; Plea Agreement, *U.S. v. Citicorp.* (D. Conn. May 20, 2015), <http://www.justice.gov/file/440486/download>; Plea Agreement, *U.S. v. J.P. Morgan Chase & Co.* (D. Conn. May 20, 2015), <http://www.justice.gov/file/440491/download>; Plea Agreement, *U.S. v. The Royal Bank of Scotland PLC* (D. Conn. May 20, 2015), <http://www.justice.gov/file/440496/download>.

235. In addition, the DOJ found that Barclays, Citi, and JPMorgan,¹⁰¹ “through [their] currency traders and sales staff, also engaged in other currency trading and sales practices in conducting FX Spot Market transactions with customers [including] (i) intentionally working customers’ limit orders one or more levels . . . away from the price confirmed . . . ; (ii) including sales markup . . . to prices given to customers . . . ; (iii) accepting limit orders from customers and then informing those customers that their orders could not be filled . . . when in fact the defendant was able to fill the order but decided not to do so because the defendant expected it would be more profitable not to do so; and (iv) disclosing non-public information regarding the identity and trading activity of the defendant’s customers to other banks or other market participants, in order to generate revenue for the defendant at the expense of its customers.”

236. In the sentencing memoranda for RBS, Barclays, Citi, and JPMorgan, the government revealed that the banks had brought “certain evidence to the attention of the United States concerning a potential antitrust conspiracy in the FX Spot Market, separate from the conspiracy charged in the Information, and involving different currencies.”¹⁰² After reporting

¹⁰¹ For RBS, the plea agreement revealed that it admitted to “(i) intentionally working customers’ limit orders one or more levels, or ‘pips,’ away from the price confirmed with the customer; and (ii) disclosing non-public information regarding the identity and trading activity of the defendant’s customers to other banks or other market participants, in order to generate revenue for the defendant at the expense of its customers. The defendant also engaged in the following conduct: (iii) intentionally altering the rates provided to certain of its customers transacting FX over a trading platform disclosed to the United States in order to generate rates that were systematically more favorable to the defendant and less favorable to customers; and (iv) in connection with the FX component of a single corporate transaction, trading ahead of a client transaction so as to artificially affect the price of a currency pair and generate revenue for the defendant, and to affect or attempt to affect FX rates, and in addition misrepresenting market conditions and trading to the client.”

¹⁰² See, e.g., Sentencing Memorandum and Motion for Departure, *U.S. v. J.P. Morgan Chase & Co.*, 3:15-CR-0079, Dkt. No. 38 (D. Conn. Dec. 1, 2016).

this fact, Bloomberg noted that “prosecutors were looking into whether banks conspired to fix prices quoted to clients for buying and selling currencies, known as a bid/ask spread.”¹⁰³

237. On January 5, 2017, Judge Stefan Underhill of the U.S. District Court for the District of Connecticut sentenced Barclays, Citi, JPMorgan, and RBS and ordered them to collectively pay \$2.5 billion in fines, as well as to serve a three year term of probation. As reported by Bloomberg, “Citigroup will pay \$925 million, Barclays \$650 million, JPMorgan \$550 million and RBS \$395 million.”¹⁰⁴ At sentencing, Judge Underhill remarked that “[m]ischief will be best deterred if the people responsible are not only fired but that any compensation made to them that was triggered by the wrongful conduct, for example bonuses, are clawed back or disgorged.” He also opined that “[f]rankly I would encourage the government to consider prosecution of individuals.”

238. Defendant UBS, which had entered a non-prosecution agreement with the DOJ in connection with investigations of manipulation of LIBOR benchmarks, was found to have breached that agreement by engaging in illegal conduct in other financial markets, including “manipulation of, or fraud in, the foreign exchange spot . . . market.”¹⁰⁵ Specifically, the DOJ found that “UBS’s deceptive currency trading and sales practices in conducting certain FX market transactions, as well as its collusive conduct in certain FX markets, violated its December 2012 non-prosecution agreement resolving the LIBOR investigation.”¹⁰⁶ UBS in turn “agreed to

¹⁰³ Erik Larson, Tom Schoenberg, & Chris Dolmetsch, *As Big Banks’ FX Case Ends, Judge Urges Probe of Traders*, Bloomberg (Jan 5, 2017), <https://www.bloomberg.com/news/articles/2017-01-05/rbs-jpm-citi-barclays-fined-2-5-billion-in-fx-rigging-case>.

¹⁰⁴ *Id.*

¹⁰⁵ Plea Agreement, *U.S. v. UBS AG* (D. Conn. May 20, 2015), <https://www.justice.gov/file/440521/download>.

¹⁰⁶ DOJ Press Release, *Five Major Banks Agree to Parent Level Guilty Pleas* (May 20, 2015), <https://www.justice.gov/opa/pr/five-major-banks-agree-parent-level-guilty-pleas>.

plead guilty to a one-count felony charge of wire fraud in connection with a scheme to manipulate LIBOR and other benchmark interest rates.”

239. On January 25, 2018, BNP Paribas pleaded guilty to conspiring to fix prices in the foreign exchange market in violation of the Sherman Act.¹⁰⁷ Between September 2011 and July 2013, BNP Paribas “conspired to suppress and eliminate competition by fixing prices in Central and Eastern European, Middle Eastern and African (CEEMEA) currencies.”

240. BNP Paribas agreed to pay a criminal fine of \$90 million as part of its sentence. The criminal information alleged that BNP Paribas and its co-conspirators 1) entered into “non-bona fide trades among themselves on an electronic FX trading platform, for the sole purpose of manipulating prices;” 2) canceling or offsetting the non-bona fide trades to hide them from other market participants; 3) “coordinated on the price, size, and timing of their bids and offers on an electronic FX trading platform in order to manipulate prices;” 4) agreeing to refrain from trading where one co-conspirator had greater need to buy or sell than the others, preventing them from adversely affecting prices for each other; 5) coordinating trading to affect fix prices; 6) agreeing on pricing to quote to customers; and 6) doing all of that through “private chat rooms, phone calls, text messages, other personal cell phone applications, and in-person meetings.”¹⁰⁸ The plea agreement was approved on May 30, 2018.¹⁰⁹

¹⁰⁷ DOJ Press Release, *BNP Paribas US Inc. Pleads Guilty to Antitrust Conspiracy* (Jan. 26, 2018), <https://www.justice.gov/opa/pr/bnp-paribas-usa-inc-pleads-guilty-antitrust-conspiracy>.

¹⁰⁸ Statement of Information, *U.S. v. BNP Paribas USA, Inc.*, 18-cr-0061, Dkt. No. 2 (S.D.N.Y. Jan. 25, 2018).

¹⁰⁹ Stewart Bishop, *BNP Paribas’ \$90M Forex Rigging Plea Deal OK’d*, Law360 (May 30, 2018), <https://www.law360.com/competition/articles/1048702/bnp-paribas-90m-forex-rigging-plea-deal-ok-d>.

241. Since March 23, 2015, the court in *In re FX* has partially stayed discovery in that case, in order to accommodate the DOJ's ongoing investigation. *Id.*, Dkt. No. 274. The discovery stay means that there will likely be more evidence of Defendants' conspiracy to manipulate the FX market forthcoming from the DOJ's investigation.

2. The DOJ Indictments of individual traders

242. The DOJ has also brought criminal charges against individual employees and former employees of Defendants for their role in manipulating the FX market.

243. *Criminal guilty pleas by Jason Katz (Barclays and BNP Paribas) and Christopher Cummins (Citi)*. On January 4, 2017, the DOJ filed criminal antitrust charges against Jason Katz, a former FX trader at Barclays and BNP Paribas.¹¹⁰ The government alleged that Katz "knowingly enter[ed] into and engag[ed] in a combination and conspiracy to suppress and eliminate competition for Central and Eastern European, Middle Eastern, and African Emerging Markets Currencies." Katz pleaded guilty on the same day.¹¹¹

244. The government alleged that Katz and "[v]arious financial institutions and individuals," effected their conspiracy by entering into non-bona fide trades among themselves on an electronic FX trading platform, by agreeing to offset or cancel the non-bona fide trades to hide them from other market participants, by coordinating on the price, size, and timing of their bids and offers to manipulate prices, by agreeing to refrain from trading when one conspirator had a greater need to buy or sell than the others, coordinating trading to manipulate fixes, coordinating trading to trigger limit orders, and agreeing on pricing to quote to specific customers. Katz and his co-conspirators implemented these tactics by communicating in chat

¹¹⁰ Statement of Information, *U.S. v. Katz*, 17-cr-0003, Dkt. No. 2 (S.D.N.Y. Jan. 14, 2017).

¹¹¹ Plea Agreement, *U.S. v. Katz*, 17-cr-0003, Dkt. No. 6 (S.D.N.Y. Jan. 14, 2017).

rooms, by phone calls, text messages, and in-person meetings. They concealed their coordinated conduct by using code names for specific customers and by using cell phones instead of business lines.

245. On January 12, 2017, Christopher Cummins, a former FX trader for Citigroup,¹¹² also pleaded guilty to criminal charges that he had conspired to manipulate prices in the Central and Eastern European, Middle Eastern, and African Emerging Markets currencies; i.e., that he was part of the same conspiracy as Katz.¹¹³

246. ***Criminal indictment of Akshay Aiyer (JPMorgan)***. On May 10, 2018, Akshay Aiyer, a former FX trader with JPMorgan, was indicted in federal court “for conspiring to fix prices and rig bids and offers in Central and Eastern European, Middle Eastern, and African (“CEEMEA”) currencies, which were generally traded against the U.S. dollar and the euro.”¹¹⁴ In furtherance of this conspiracy, from at least as early as October 2010 through at least July 2013, Aiyer coordinated with other New York-based CEEMEA traders working for rival banks, including Jason Katz and Christopher Cummins, “to suppress competition in order to increase each trader’s profits and decrease each trader’s losses.” In particular, Aiyer and his co-conspirators engaged in “near-daily” conversations through private electronic chat rooms, telephone calls, and text messages, “in which they exchanged trading positions, confidential customer information, planned pricing for customer orders, and other categories of competitively

¹¹² Stewart Bishop, *Ex-Citigroup trader cops to forex manipulation*, Law360 (Jan 12, 2017), <https://www.law360.com/competition/articles/880488/ex-citigroup-currency-trader-cops-to-forex-manipulation>.

¹¹³ See Statement of Information, *U.S. v. Cummins*, 17-cr-0026, Dkt. No. 2 (S.D.N.Y. Jan. 12, 2017).

¹¹⁴ DOJ Press Release, *Former Currency Trader Indicted for Participating in Antitrust Conspiracy* (May 10, 2018), <https://www.justice.gov/opa/pr/former-currency-trader-indicted-participating-antitrust-conspiracy>.

sensitive information.” They then used this information to coordinate their live trading in CEEMEA currencies, and took affirmative steps throughout the conspiracy to conceal their anticompetitive behavior such as “using code names when discussing customers, communicating with each other using text messages and other cell phone applications, calling one another on personal cell phones during work hours, and meeting in person in the Southern District of New York to discuss particular customers and trading strategies.”¹¹⁵

247. ***Criminal indictments and trial of Richard Usher (JPMorgan and RBS), Rohan Ramchandani (Citi) and Christopher Ashton (Barclays).*** On January 10, 2017, Richard Usher (former Head of G11 FX Trading-UK at RBS, as well as former Managing Director at JPMorgan), Rohan Ramchandani (former Managing Director and head of G10 FX spot trading at Citi) and Christopher Ashton (former Head of Spot FX at Barclays) were indicted for conspiring to fix prices and rig bids for U.S. dollars and euros exchanged in the FX spot market.¹¹⁶ The charge accuses the three defendants of using chat rooms, electronic messages, and telephone calls to coordinate their collusion. The charged conduct was aimed explicitly at controlling prices, influencing the benchmark rates, and coordinating their trading activity to move the market in ways that garner profits for Defendant banks. The three waived extradition and appeared in federal court in Manhattan.¹¹⁷

248. On May 4, 2018, the U.S. District Court for the Southern District of New York refused to dismiss the charges brought against Usher, Ramchandani, and Ashton, finding that the

¹¹⁵ Indictment, *U.S. v. Aiyer*, 18-cr-0333, Dkt. No. 1 (S.D.N.Y. May 10, 2018).

¹¹⁶ DOJ Press Release, *Three Former Traders for Major Banks Indicted in Foreign Currency Exchange Antitrust Conspiracy* (Jan. 10, 2017), <https://www.justice.gov/opa/pr/three-former-traders-major-banks-indicted-foreign-currency-exchange-antitrust-conspiracy>.

¹¹⁷ Chad Bray, *Ex-Traders in Britain Face Currency-Rigging Charges in U.S.*, N.Y. Times (June 13, 2017), <https://www.nytimes.com/2017/06/13/business/dealbook/currency-usd-trader-britain-exchange.html>.

indictment set forth a per se violation of the Sherman Act.¹¹⁸ On September 24, 2018, the Court denied defendants' motion in limine and held that prosecutors could inform the jury at trial that the former employers of these traders, including Defendants Barclays, JPMorgan and Citi, had themselves pled guilty to FX price-fixing.¹¹⁹

249. Usher, Ramchandani, and Ashton's criminal trial began on October 10, 2018. Matt Gardiner, a former FX trader at UBS, was called as the government's key fact witness at trial. Shortly after news of the FX scandal broke in late 2013, Gardiner had approached UBS and offered to assist in the internal investigation that UBS was undergoing in cooperation with the U.S. government. Gardiner was interviewed by the DOJ and FBI in early December 2013, and entered into a non-prosecution agreement with the government in August 2015.¹²⁰

250. Gardiner testified at trial that, beginning in December 2007 and continuing until early 2013, he was an active participant in The Cartel chatroom with these three defendants wherein they colluded to share confidential client order information and coordinate trading for the purpose of manipulating EUR/USD prices. The prosecution introduced transcripts of these chat sessions, and played audio recordings of calls that Gardiner had with the defendants in which they planned how to most effectively manipulate EUR/USD, the most traded currency pair in the world.

251. Beginning in the later half of 2000, Gardiner worked as a GBP currency trader at Citi New York, and in 2004, he went to work at Citi London where he interacted frequently with Ramchandani. In 2007, Gardiner joined Barclays London to trade EUR/USD and he stayed in

¹¹⁸ See, e.g., Decision & Order, *U.S. v. Usher, et al.*, 17-cr-0019-RMB-1, Dkt. No. 95 (S.D.N.Y. May 4, 2018).

¹¹⁹ See, e.g., Decision & Order, *U.S. v. Usher, et al.*, 17-cr-0019-RMB-1, Dkt. No. 152 (S.D.N.Y. September 24, 2018).

¹²⁰ Trial Transcript at 414-16, 422, *U.S. v. Usher, et al.*, No. 17-cr-19 (S.D.N.Y.).

contact with Ramchandani and others at Citi using Reuters and Bloomberg chatrooms.¹²¹

Gardiner met Usher in late 2009 through a mutual friend and by December 2007, Gardiner was chatting with Usher and Ramchandani in The Cartel chatroom every working day, with Gardiner testifying that “[i]t was open from when I got to the office and logged into Bloomberg until I left. So it's fair to say all day.”¹²²

252. At Barclays, Gardiner was tasked with growing the EUR/USD desk.¹²³ He was “responsible for every eurodollar trade,” and had “complete discretion” to make such trades.¹²⁴ When he started at Barclays, Gardiner testified that he participated in “10, 15” chatrooms a day, and that number “grew quite quickly” during his time there.¹²⁵ Towards the end of his time at Barclays, Gardiner served as co-head of the EUR/USD trading desk with Ashton. When Gardiner left to join UBS in late 2011, Ashton took over as head of the eurodollar desk at Barclays and became a member of The Cartel chatroom.¹²⁶

253. The Cartel members agreed “not to deliberately trade to each other’s disadvantage, to share information openly and honestly and, where possible, help each other avoid losses and make profits.”¹²⁷ Gardiner would share his open position with the defendants when he needed help exiting it, and per the agreement, these traders were expected not to trade against each other once an open position was revealed.¹²⁸ The Cartel members generally

¹²¹ *Id.* at 324-28, 374-76.

¹²² *Id.* at 378-79, 405.

¹²³ *Id.* at 330.

¹²⁴ *Id.* at 343-44.

¹²⁵ *Id.* at 379.

¹²⁶ *Id.* at 694.

¹²⁷ *Id.* at 406.

¹²⁸ *Id.* at 425.

honored this agreement, and being in The Cartel felt like being on a “small team in very choppy seas.”¹²⁹ “Being a good trader means that you make profit for your bank and, therefore, for yourself. So overall, being in this chat helped me do that I believe.”¹³⁰

254. Between December 2007 and at least September 2013, chatroom transcripts, audio recordings, trading history spreadsheets, and testimony presented at trial show that the Cartel members engaged in a range of collusive conduct aimed at manipulating FX prices including: (1) exchanging “ammo” prior to a fix; (2) “double” or “triple” teaming the WMR/ECB fix by coordinating their trading at the time of the fix; (3) “matching off” or netting orders between traders so as not to execute such orders in the fix measurement period; and (4) manipulating the EUR/USD spot price throughout the day.

255. Gardiner was shown several Bloomberg chat transcripts in which Cartel members exchanged “ammo” in the minutes leading up the WMR and ECB fixes. When two or more Cartel members were on the same side of the trade pre-fix, e.g., two traders that had an open short position, they would often consolidate their orders with a single trader to more effectively manipulate the fix price. “In the case of giving ammo, it's literally transferring one volume to another trader.”¹³¹ For instance, on December 22, 2008, Ramchandani offers to give his ECB fixing volume to Usher for him to trade. After the fix, Usher wrote “I thank you all,” and Ramchandani replied, “1 team.”¹³² Usher made around \$750,000 on his trade.¹³³ Later in the same chat, Usher discussed trading 110 million euros in “ammo” to Ramchandani prior to the

¹²⁹ *Id.* at 505.

¹³⁰ *Id.* at 506.

¹³¹ *Id.* at 604.

¹³² *Id.* at 608-9.

¹³³ *Id.* at 614.

WMR fix, which Ramchandani then used to influence price at the fix. After the fix, the Cartel members congratulated Ramchandani, with Usher writing “share the love” and Gardiner writing “Merry Christmas from Rich & Foss.”¹³⁴ Gardiner estimated that Ramchandani made around \$350,000 on that trade.¹³⁵

256. Other times when two or more members of the Cartel had open positions on the same side of the trade, they would “double team” or “triple team” the fix, i.e., they would coordinate their trading such that they could drive the fix price higher or lower, depending on whether they were long or short EUR/USD. For example, in a chat that occurred on January 17 and 18, 2011, Usher announced that he was 400 million euros on the “left hand side,” i.e., he would be selling 400 million euros at the ECB fix.¹³⁶ Gardiner then announced that he was on the left hand side as well, and would be selling 300 million euros at the fix. Gardiner and Usher then had a phone call in which they agreed to “double team” the fix. After the fix, Gardiner wrote in chat: “Turned out nice.” Ramchandani congratulated them both: “Nice work boys.”¹³⁷

257. When Cartel members were expecting to trade opposing sides of a fix, they would often coordinate to “match off” their trades prior to the fix so that they did not end up trading against each other. For instance, in a June 27, 2011 Bloomberg chat, Usher and Ramchandani announced prior to the ECB fix that they were both on the “left hand side,” i.e., they would be selling at the fix.¹³⁸ Gardiner was on the “right hand side,” but instead of buying at the fix, he

¹³⁴ *Id.* at 612.

¹³⁵ *Id.* at 613.

¹³⁶ *Id.* at 677-78.

¹³⁷ *Id.* at 683.

¹³⁸ *Id.* at 636.

did a “match trade” with Usher whereby Usher sold Gardiner 62 million euro prior to the fix.¹³⁹ Gardiner testified that he believed his matching trade affected the ECB fix price on this occasion.¹⁴⁰

258. The prosecution also introduced into evidence several Bloomberg chats showing that Cartel members manipulated EUR/USD spot prices on a daily basis. Around once or twice a day, Gardiner and other Cartel members would announce their “open position” or “open risk.” When a Cartel member sold euros to a customer or bought euros from a customer, that Cartel member would then have an open position, either long or short, which they would need to close by purchasing or selling euros. If the market price moved adversely to the Cartel member before they could close their position, they would suffer a loss. Thus, Cartel members would announce their open positions so that other Cartel members would not trade against them and adversely affect the price. For instance, on December 13, 2007, Usher informed Gardiner in a Bloomberg chatroom that he had an 80 million euro open short position, i.e., Usher needed to purchase euros and therefore did not want the price to increase.¹⁴¹ Gardiner testified that, even though it would have been beneficial for him to buy euros in this instance, he did not buy euros because he, Usher and the other Cartel members agreed no “to move the market against . . . the trader who expressed the open position.”¹⁴² “It was a gentleman’s agreement.”¹⁴³ Later that day, Usher

¹³⁹ *Id.* at 643.

¹⁴⁰ *Id.* at 645.

¹⁴¹ *Id.* at 394.

¹⁴² *Id.*

¹⁴³ *Id.* at 395.

reciprocated by warning Gardiner that the Eurodollar was about to “get hit hard in ten minutes.”¹⁴⁴

259. In addition to announcing their open positions, Cartel members would use code words to disclose which customers they were trading on behalf of. On February 15, 2010, Gardiner announced to the group that he had an open short position and needed help, but about one-and-a-half minutes later announced that he was in the “clear.”¹⁴⁵ Usher asked him who his customer was, and Gardiner wrote it was “a bit of a coin toss I’d say.”¹⁴⁶ Gardiner testified that “coin toss” was code for the People’s Bank of China, and that over time he used other code words such as “heads up” and “big boy” to refer to this bank in chats. “Simply put, it was just generally—everyone was doing it ... everyone wanted to know when the big market-moving customers were trading.”¹⁴⁷

260. As further evidence that members of the Cartel chatroom influenced the WMR and ECB fix prices, the government’s data analytics expert, Jeremy Tilsner, analyzed their trading data during the fix measurement periods.¹⁴⁸ The data showed that on days analyzed, the Cartel members’ trades made up a substantial portion of the trading volume that occurred during the ECB and WMR fixing windows. For instance, on June 20, 2011, in the minute leading up to the ECB fix, Ramchandani and Usher sold a total of 290 million euros, which comprised 62.77% of all euro selling on the EBS platform that occurred in that one-minute window.¹⁴⁹ Similarly,

¹⁴⁴ *Id.* at 397.

¹⁴⁵ *Id.* at 471.

¹⁴⁶ *Id.* at 473.

¹⁴⁷ *Id.* at 479.

¹⁴⁸ *Id.* at 1363. Mr. Tilsner pulled such trading data from an electronic trading platform exchange known as EBS, which is “the largest platform” for trading the euro. *Id.* at 148.

¹⁴⁹ *Id.* at 1370-71.

on November 13, 2008, Usher, Ramchandani and Gardiner purchased a total of 205 million euro during the WMR fixing window, which comprised a total of 52.16% of all euro buying on EBS during that time period.¹⁵⁰

261. Gardiner testified that between December 2007 and early 2013 he understood, in theory, that bank compliance or management could read his chats. But in practice, he never met with compliance and did not believe anyone at the bank was reviewing his chats or listening to his phone calls.¹⁵¹

262. Gardiner recalled that in the first half of 2012 while he was at UBS, “[t]here was a general sense of concern amongst traders in all currencies pairs” stemming from the LIBOR scandal, “and it raised the question generally speaking of whether collusion around the fix . . . was a problem in foreign exchange trading.”¹⁵² Additionally, during the same time period, Gardiner’s supervisor at UBS, Niall O’Riordan, told him not to use the word “fix” when chatting with other banks “because it might be flagged by compliance” and it would save O’Riordan “a lot of aggravation.”¹⁵³ Gardiner testified that after this conversation, he would still talk in chats but he would not use the word “fix,” he would instead use “fix” code words like “pick un,” “trout,” or “tromf.”¹⁵⁴ In a July 2, 2012 Bloomberg chat, after Usher asked if there was “[a]ny pick un” and matched off a trade with Ramchandani, Usher wrote: “for compliance purpose, no collusion going on here” and laughed.¹⁵⁵

¹⁵⁰ *Id.* at 1389.

¹⁵¹ *Id.* at 477, 781.

¹⁵² *Id.* at 771.

¹⁵³ *Id.* at 773.

¹⁵⁴ *Id.* at 774.

¹⁵⁵ *Id.* at 777.

263. In mid-2012, Ashton left The Cartel chatroom because he was told by Barclays compliance that he could no longer participate in “multibank chatrooms.”¹⁵⁶ However, Gardiner continued to chat with Ashton one-on-one, which Barclays compliance still allowed.¹⁵⁷ When compliance prohibited Ramchandani from accessing The Cartel chatroom in January 2013, he also started engaging in one-on-one chats with Gardiner. In a January 31, 2013 Bloomberg chat, Ramchandani wrote: “Guys, it’s been fun. We’re not allowed to have more than one on one chats anymore. So I have to leave this room and will call you [individually].”¹⁵⁸ Gardiner also confirmed that the “gentlemen’s agreement” among the Cartel members continued into late 2013.¹⁵⁹

264. ***Criminal conviction of Stuart Scott (HSBC)***. On December 7, 2011, Stuart Scott and Mark Johnson of HSBC concocted a scheme to get Cairn Energy, a client, to engage in a \$3.5 billion GBP/USD transaction at 3 p.m. (before that day’s closing WM/R fix), so that Johnson, Scott, and their cohorts could more easily manipulate prices in their favor—and without the client’s knowledge—by front-running the transaction.¹⁶⁰ Their scheme netted the bank more

¹⁵⁶ *Id.* at 781-82.

¹⁵⁷ *Id.* at 782.

¹⁵⁸ *Id.* at 788.

¹⁵⁹ *Id.* at 788-89. On October 26, 2018, the jury acquitted Usher, Ramnchandani, and Ashton of the charges against them. The higher standard for criminal liability and the role of these individuals’ state of mind, among other things, distinguish the outcome in that trial of individual traders from the claims here against the banks that employed them. As discussed above, each of those bank defendants has already pleaded guilty to criminal charges by the DOJ for conspiring to manipulate the FX market.

¹⁶⁰ Patricia Hurtado and Lananh Nguyen, *Ex-HSBC Currency Trader Convicted of Fraud for Front-Running*, Bloomberg (Oct. 23, 2017), <https://www.bloomberg.com/news/articles/2017-10-23/ex-hsbc-currency-trader-is-convicted-of-fraud-for-front-running>.

than \$8 million dollars, which prompted Johnson to say “Ohhhh, fucking Christmas.”¹⁶¹ In another recorded phone conversation between Johnson and Scott, they discussed how high they could ramp up the price of sterling before Cairn would “squeal.”¹⁶² When Cairn approached HSBC regarding the resultant change in price, Johnson informed the client that “a Russian name” had affected the price. The case against Johnson went to trial in mid-2017, and he was convicted of fraud and conspiracy on October 23, 2017. On April 26, 2018, Johnson was sentenced to 24 months imprisonment for committing wire fraud and wire fraud conspiracy, to be followed by five years supervised release.

265. HSBC has entered a deferred prosecution agreement for the Cairn scheme, as well as another scheme to defraud an unidentified bank. HSBC agreed to pay \$101.5 million dollars to resolve these charges.¹⁶³

266. During Johnson’s trial, Frank Cahill, who was terminated by Goldman Sachs as alleged below, testified under a non-prosecution with the Department of Justice. Cahill was offered immunity for conduct that included disclosing confidential information as well as collusive activity to coordinate trading across multiple banks to impact the fixes—the subject matter of this lawsuit—as it was “evident that global regulatory bodies believed that some of the

¹⁶¹ DOJ Press Release, *Global Head Of HSBC’s Foreign Exchange Cash-Trading Desks Arrested For Orchestrating Multimillion-Dollar Front Running Scheme* (July 20, 2016), <https://www.justice.gov/usao-edny/pr/global-head-hsbc-s-foreign-exchange-cash-trading-desks-arrested-orchestrating>.

¹⁶² Patricia Hurtado, *HSBC Traders Used Code Word to Trigger Front-Running*, U.S. Says, Bloomberg (Oct. 5, 2017), <https://www.bloomberg.com/news/articles/2017-10-06/hsbc-currency-unit-used-code-to-trigger-front-running-u-s-says>.

¹⁶³ DOJ Press Release, *HSBC Holdings Plc Agrees to Pay More than \$100 Million to Resolve Fraud Charges* (Jan. 18, 2018), <https://www.justice.gov/opa/pr/hsbc-holdings-plc-agrees-pay-more-100-million-resolve-fraud-charges>.

behavior on these chat rooms were unacceptable.”¹⁶⁴ Of that trading, Cahill said “we were certainly sharing information with other banks regarding the fix” and he “certainly hoped my trading and the trading of other traders would influence the market which would benefit my position.”¹⁶⁵ Cahill was employed at HSBC at the time of the Cairn transaction, and he admitted during trial that HSBC’s trading in advance of the December 7, 2011 fix was not in Cairn’s best interest,¹⁶⁶ demonstrating a recurring theme in the FX market: the bank, not the client, always comes first.

267. ***Criminal indictment of Robert Bogucki (Barclays)***. Robert Bogucki, the former head of foreign currency exchange trading in Barclay’s New York office was indicted on January 16, 2018 for defrauding and conspiring to defraud Hewlett-Packard, Inc. (“HP”) in connection with HP’s purchase and subsequent sale of £6 billion worth of GBP/USD options from Barclays in August 2011.¹⁶⁷ These options gave Barclays the right, but not the obligation, to exchange GBP/USD at a fixed rate. In September 2011, HP determined it would not need the options, so it began to sell them back into the market, through Barclays, little by little. Later that month, Bogucki advised HP it would be in their “best interest” to trade on specific days, and that Barclays FX traders “were not touching the market.”

¹⁶⁴ Trial Transcript at 984, 1031-33, *U.S. v. Johnson*, No. 16-cr-457-NCG-1 (E.D.N.Y.).

¹⁶⁵ Trial Transcript at 1032-33, *U.S. v. Johnson*, No. 16-cr-457-NCG-1 (E.D.N.Y.).

¹⁶⁶ Patricia Hurtado, *Ex-HSBC Trader Says Boss Ordered Him to ‘Ramp’ Up Price of Pound*, Bloomberg (Oct. 5, 2017), <https://www.bloomberg.com/news/articles/2017-10-05/ex-hsbc-trader-says-boss-ordered-him-to-ramp-up-price-of-pound>.

¹⁶⁷ DOJ Press Release, *Former Head of Barclays New York Foreign Exchange Operation Indicted for Orchestrating Multimillion-Dollar Front-Running Scheme* (Jan. 16, 2018), <https://www.justice.gov/opa/pr/former-head-barclays-new-york-foreign-exchange-operation-indicted-orchestrating-multimillion>.

268. In reality, Bogucki directed another Barclays FX trader that “it would be nice to short, short ahead of” the planned unwind, so short they did.¹⁶⁸ As Barclays executed HP’s sales, its other FX traders traded in such a way as to depress the value of HP’s options, or, as Bogucki said “offer this fucking shit down.” One trader informed Bogucki that he planned to “bash the shit out of” and “spank the market” to depress the option value. Another trader discussed “hammer[ing] the market lower.”¹⁶⁹ Bogucki and the other Barclays traders agreed to blame the drop in price on the activity of other banks. DOJ alleges that Barclays made millions off of the fraud.

269. The DOJ filed a superseding indictment against Bogucki in March 2018, recharging him under the Financial Institutions Reform, Recovery and Enforcement Act (“FIRREA”) due to concerns that the fraud charge against Bogucki was time-barred.¹⁷⁰ Bogucki’s jury trial is currently set to begin in February 2019.¹⁷¹

3. The CFTC Orders on Barclays, Citi, HSBC, JPMorgan, RBS, and UBS

270. The Commodity Futures Trading Commission (“CFTC”) is an independent U.S. government agency that regulates futures, options, and swaps. The CFTC’s stated mission is to “foster open, transparent, competitive, and financially sound markets, to avoid systemic risk, and

¹⁶⁸ Indictment, *U.S. v. Bogucki*, 5:18-cr-0021-EJD, Dkt. No. 1 (N.D. Cal. Jan. 16, 2018), <https://www.justice.gov/opa/press-release/file/1026696/download>.

¹⁶⁹ Stewart Bishop, *Barclays Forex Boss Charged With Defrauding HP*, Law360 (January 17, 2018), <https://www.law360.com/articles/1002692/barclays-forex-boss-charged-with-defrauding-hp>.

¹⁷⁰ Dean Seal, *Ex-Barclays Trader Slams DOJ’s ‘Futile’ FIRREA Indictment*, Law360 (April 27, 2018), <https://www.law360.com/articles/1038291/ex-barclays-trader-slams-doj-s-futile-firrea-indictment>.

¹⁷¹ Cara Bayles, *Judge Slams DOJ Jury Trial Bid In Ex-Barclays Trader Case*, Law360 (June 19, 2018), <https://www.law360.com/articles/1054741/judge-slams-doj-jury-trial-bid-in-ex-barclays-trader-case>.

to protect the market users and their funds, consumers, and the public from fraud, manipulation, and abusive practices related to derivatives and other products that are subject to the Commodity Exchange Act.”¹⁷²

271. Around 2013, the CFTC launched an investigation into whether certain banks had manipulated the FX market in violation of the Commodity Exchange Act (“CEA”). On November 11, 2014, the CFTC entered into five separate Orders against Defendants Citi, HSBC, JPMorgan, RBS, and UBS.¹⁷³ And on May 20, 2015, the CFTC entered a similar Order against Defendant Barclays, which reportedly pulled out of prior settlement discussions with the CFTC and other regulators due to concerns about civil liabilities and the potential of having its New York banking license revoked.¹⁷⁴ The CFTC concluded that these Defendants violated the CEA by conspiring with other banks to manipulate FX benchmark rates, including the WM/Reuters Closing Rate. The CFTC levied substantial civil penalties on each of these Defendants: \$400 million on Barclays, \$310 million each on Citi and JPMorgan, \$290 million each on RBS and UBS, and \$275 million on HSBC.

272. The CFTC found that each of these Defendants “by and through certain of [their] FX traders, at times sought to benefit its own trading positions or those of certain FX traders at other banks by attempting to manipulate and aiding and abetting certain traders at other banks in

¹⁷² CFTC, *Mission & Responsibilities*, <http://www.cftc.gov/About/MissionResponsibilities/index.htm>.

¹⁷³ CFTC Press Release No. 7056-14, *CFTC Orders Five Banks to Pay over \$1.4 Billion in Penalties for Attempted Manipulation of Foreign Exchange Benchmark Rates* (Nov. 12, 2014), <http://www.cftc.gov/PressRoom/PressReleases/pr7056-14>.

¹⁷⁴ CFTC Press Release No. 7181-15, *Barclays to Pay \$400 Million Penalty to Settle CFTC Charges of Attempted Manipulation and False Reporting of Foreign Exchange Benchmark Rates* (May 20, 2015), <http://www.cftc.gov/PressRoom/PressReleases/pr7181-15>.

their attempts to manipulate certain foreign exchange benchmark rates.”¹⁷⁵ Specifically, Defendants’ FX traders “coordinated their trading with certain FX traders at other banks to attempt to manipulate certain FX benchmark rates, including the 4 p.m. WM/Reuters Closing Rate fixing period, to their benefit. These FX traders . . . and the other banks used private electronic chat rooms to communicate and plan their attempts to manipulate the FX benchmark rates for certain currency pairs.” In those electronic chat rooms, these Defendants also “disclosed confidential customer order information and trading positions, altered trading positions to accommodate the interests of the collective group, and agreed on trading strategies as part of an effort by the group to attempt to manipulate certain FX benchmark rates.”

273. The CFTC found that this misconduct occurred because Defendants “failed to adequately assess the risks associated with [their] FX traders participating in the fixing of certain FX benchmark rates,” and “lacked adequate internal controls in order to prevent [their] FX traders from engaging in improper communications with certain FX traders at other banks.”¹⁷⁶ The CFTC also found that these Defendants “lacked sufficient policies, procedures and training specifically governing participation in trading around the FX benchmarks rates; and had inadequate policies pertaining to, or sufficient oversight of, their FX traders’ use of chat rooms or other electronic messaging.” The CFTC observed that Citi, HSBC, and JPMorgan have each since banned the use of multi-bank chat rooms by FX personnel.

274. The CFTC concluded that Barclays, Citi, HSBC, JPMorgan, RBS, and UBS each violated the CEA in several ways: (i) by attempting to manipulate the price of a commodity in

¹⁷⁵ See, e.g., Order Instituting Proceedings, *In the Matter of Citibank, N.A.*, CFTC Dkt. No. 15-03 (Nov. 11, 2014), <https://cftc.gov/sites/default/files/groups/public/@Irenforcementactions/documents/legalpleading/enfcitibankorder111114.pdf>.

¹⁷⁶ CFTC Press Release No. 7056-14, *CFTC Orders Five Banks to Pay over \$1.4 Billion in Penalties for Attempted Manipulation of Foreign Exchange Benchmark Rates* (Nov. 12, 2014), <http://www.cftc.gov/PressRoom/PressReleases/pr7056-14>.

violation of CEA Sections 6(c), 6(d) and 9(a)(2) (7 U.S.C. §§ 9, 13b, and 13(a)(2) (2012)) and Regulation 180.2, 17 C.F.R. § 180.2 (2014); (ii) by aiding and abetting the attempts of traders at other banks to manipulate FX benchmark rates, in violation of CEA Section 13(a) (7 U.S.C. § 13c(a) (2012)); and (iii) as a principal responsible for the acts, omissions, and failures of any traders who acted as their employees and/or agents, in violation of CEA Section 2(a)(1)(B) (7 U.S.C. § 2(a)(1)(B) (2012)), and Regulation 1.2 (17 C.F.R. § 1.2 (2014)).

275. The CFTC ordered that Barclays, Citi, HSBC, JPMorgan, RBS, and UBS undertake remedial measures to improve their internal controls and procedures, including monitoring systems to detect manipulation of FX benchmark rates, periodic audits of their FX operations, supervision of FX trading desks, and ongoing training and reviews of FX traders.

276. The CFTC's findings are supported by many specific examples of misconduct by each of these Defendants, generally in the form of transcripts of chat room conversations that the CFTC released with its Orders.

4. The FCA Notices on Barclays, Citi, HSBC, JPMorgan, RBS, and UBS

277. The Financial Conduct Authority ("FCA") is an independent financial regulatory body in the U.K., whose stated objectives are to "protect consumers," "protect financial markets," and "promote competition."¹⁷⁷

278. The FCA launched its own investigation into the banks' manipulation of the FX market. On November 11, 2014, the FCA entered Final Notices on Defendants Citi, HSBC, JPMorgan, RBS, and UBS.¹⁷⁸ The FCA found that each of these Defendants violated the FCA's Principles of Business by failing to "control its trading operations in the G10 spot FX market,

¹⁷⁷ FCA, *What we do*, <http://www.fca.org.uk/about/what>.

¹⁷⁸ FCA Press Release, *FCA fines five banks 1.1 billion for FX failings and announces industry-wide remediation program* (Nov. 12, 2014), <http://www.fca.org.uk/news/fca-fines-five-banks-for-fx-failings>.

with the result that traders in this part of its business were able to behave in a manner that put [its own] interests ahead of the interests of its clients, other market participants and the wider UK financial system.” The FCA levied substantial civil penalties on each of these Defendants: \$358 million on Citi, \$343 million on HSBC, \$352 million on JPMorgan, \$344 million on RBS, and \$371 million on UBS.

279. The FCA found that Citi, HSBC, JPMorgan, RBS, and UBS each “allowed the following behaviours to occur . . . (1) Attempts to manipulate the WMR and the ECB fix rates in collusion with traders at other firms, for [its] own benefit and to the potential detriment of certain of its clients and/or other market participants; (2) Attempts to trigger clients’ stop loss orders for [its] own benefit and to the potential detriment of those clients and/or other market participants; and (3) Inappropriate sharing of confidential information with traders at other firms, including specific client identities and, as part of (1) and (2) above, information about clients’ orders.”

280. The FCA detailed the various techniques that each of these Defendants used to accomplish this manipulation, including by “taking out the filth” or “clearing the decks” (netting off orders with third parties who had positions in the opposition direction as Defendants’), “giving you the ammo” (consolidating orders with a single trader to more effectively carry out a manipulation strategy), “building” (transacting with third parties to increase the volume of orders in the desired direction), and “overbuying” or “overselling” (increasing the volume traded at the fix in the desired direction in excess of the amount necessary to manage risk).

281. The FCA held that these Defendants’ misconduct was “extremely serious” and “had a very serious and adverse effect on markets . . . due to the fundamental importance of spot FX benchmarks and intra-day rates for G10 currencies, their widespread use by market

participants and the consequent negative impact on confidence in the spot FX market and the wider UK financial system arising from misconduct in relation to them.”

282. On May 20, 2015, the FCA imposed its “largest ever financial penalty” of over £284 million against Barclays for its failure to control its business practices in the FX market. The FCA’s acting director of financial enforcement and market oversight Georgina Philippou commented that “Barclays allowed a culture to develop which put the firm’s interests ahead of those of its clients and which undermined the reputation and integrity of the UK financial system.”¹⁷⁹ The FCA found that from January 1, 2008 to October 15, 2013, Barclays traders took advantage of failed systems to engage in many inappropriate practices, including inappropriate sharing of client information, attempts to manipulate FX currency rates, collusion with other traders. Even some of those in Barclays management were found to have overlooked and participated in the inappropriate conduct, reflecting “a failure to embed the right values and culture in Barclays’ FX business.”

283. The FCA found that Barclays traders formed collusive tight-knit groups with individuals from other banks. These groups engaged in electronic communications, including through chat rooms that were appropriately named phrases such as “the players.” Barclays traders participated in such chat rooms and used information gathered from their accomplices to make trades that benefited themselves. One chat room participant referred to other traders as “the 3 musketeers” and commented “we all die together.” Barclays traders attempted to manipulate the fix rates and trigger stop-orders. The manipulations, in particular, aimed to prevent payouts on options that clients had purchased from Barclays. The market manipulation was “to ensure that the rate at which the bank had agreed to sell a particular currency to its

¹⁷⁹ FCA Press Release, *FCA fines Barclays £284,432,000 for forex failings* (May 20, 2015), <https://www.fca.org.uk/news/fca-fines-barclays-for-forex-failings>.

clients was higher than the average rate at which it had bought that currency in the market to ensure a profit for Barclays.” The effects the FCA also found the sharing of client information, including client identities and orders, which created significant potential for client detriment.

5. The OCC Orders on BofA, Citi, and JPMorgan

284. The Office of the Comptroller of the Currency (“OCC”) is an independent bureau of the U.S. Department of the Treasury which regulates and supervises all national banks and federal savings associations. The OCC’s stated mission is to “ensure that national banks and federal savings associations operate in a safe and sound manner, provide fair access to financial services, treat customers fairly, and comply with applicable laws and regulations.”¹⁸⁰

285. The OCC conducted an examination of several national banks for their involvement in the manipulation of the FX market. On November 11, 2014, the OCC entered Consent Orders against BofA, Citi, and JPMorgan.¹⁸¹ The OCC “identified certain deficiencies and unsafe or unsound practices related to” each of those Defendants’ FX operations, and levied substantial fines: \$250 million on BofA, and \$350 million each on Citi and JPMorgan.

286. Like the other regulators, the OCC found that these Defendants used electronic messaging platforms to manipulate FX prices and benchmark rates, including by means of:

- (a) Discussions of coordinating trading strategies among the Bank’s traders and traders at others banks to manipulate the WM/Reuters spot FX benchmark rates or ECB spot FX reference rates to the benefit of the trader or the Bank or both and to the potential detriment to some of the Bank’s customers;
- (b) Discussions of trading, either alone or collusively, to trigger customers’ limit orders, such as stop loss or take profit orders, or customers’ barrier options for the trader or Bank’s benefit and to the potential detriment of such customers;

¹⁸⁰ OCC, *About the OCC*, <http://www.occ.gov/about/what-we-do/mission/index-about.html>.

¹⁸¹ OCC News Release No. 2014-157, *OCC Fines Three Banks \$950 Million for FX Trading Improprieties* (Nov. 12, 2014), <http://www.occ.gov/news-issuances/newsreleases/2014/nr-occ-2014-157.html>.

(c) Discussions of trading in advance of pending customers' orders for the trader or Bank's benefit and to the potential detriment of such customers;

(d) Discussions which resulted in disclosure of confidential Bank information, including the disclosure of information regarding customer order flows and proprietary Bank information, such as FX rate spreads.

287. The OCC found that BofA, Citi, and JPMorgan "had deficiencies in [their] internal controls and had engaged in unsafe or unsound banking practices with respect to the oversight and governance of [their] FX Trading," which allowed the aforementioned practices to occur. The OCC ordered that BofA, Citi, and JPMorgan implement extensive remedial procedures, including effective controls, oversight, monitoring, surveillance, compliance testing, and regular audits of its FX trading activities.

288. The OCC has also issued fines on individual traders. On January 11, 2017, the OCC issued a notice of charges for prohibition and notice of assessment of civil money penalty against Richard Usher, former Head of G10 Spot Trading at JPMorgan, and Rohan Ramchandani, former Head of European Spot Trading at Citi.¹⁸² They were each fined \$5 million "for violating the Sherman Antitrust Act, engaging in unsafe or unsound practices, and breaching their fiduciary duties related to their conduct in the [FX] market."¹⁸³ The OCC found that Usher and Ramchandani had "(i) coordinated trading in the EUR/USD currency pair in connection with the World Markets/Reuters FOREX spot benchmarks and European Central Bank reference rates (known as "fixes"); (ii) agreed to withhold bids and offers when one trader in the conspiracy was actively trading so that the price of the currency would not move in a

¹⁸² OCC Press Release, *OCC Issues Notice of Charges to Prohibit and Assess \$5 Million Penalty Against Two Foreign Exchange Traders* (Jan. 11, 2017), <https://www.occ.treas.gov/news-issuances/news-releases/2017/nr-occ-2017-6.html>.

¹⁸³ *Id.*

direction adverse to the trader who was actively trading in the market; and (iii) disclosed, discussed, and coordinated currency pair spreads to be quoted to customers.”¹⁸⁴

289. On information and belief, the OCC’s investigations are still ongoing, and may result in similar Orders and findings as to these and other Defendants.

6. The FINMA Report on UBS

290. The Financial Market Supervisory Authority (“FINMA”) is an independent Swiss government institution responsible for financial regulation, including the supervision of banks. FINMA’s stated mandate is to “protect the interests of creditors, investors and insured persons and to ensure the proper functioning of the financial markets.”¹⁸⁵

291. In September 2013, UBS informed FINMA and other authorities that an internal UBS investigation “had uncovered possible signs of manipulation, collusion, and other market abusive conduct” in FX trading. FINMA initiated enforcement proceedings against UBS, and released a Report of its findings on November 12, 2014.¹⁸⁶ FINMA concluded that UBS “repeatedly and over a long period of time at least attempted to manipulate foreign exchange benchmarks and acted against the interests of its own clients.” FINMA held that by doing so, UBS “seriously violated the requirements for proper business conduct and those for adequate organization stipulated in supervisory law,” and imposed a fine of 134 million francs (\$141 million USD).

292. Specifically, FINMA found that:

[UBS’s FX traders] repeatedly and over longer periods of time at least attempted (or deliberately accepted the possibility of) manipulation of foreign exchange

¹⁸⁵ FINMA, *About FINMA*, <http://www.finma.ch/e/finma/Pages/Ziele.aspx>.

¹⁸⁶ FINMA Press Release, *FINMA sanctions foreign exchange manipulation at UBS* (Nov. 12, 2014), <http://www.finma.ch/e/aktuell/pages/mm-ubs-devisenhandel-20141112.aspx>.

benchmarks by aggressively executing trades of large volume so as to generate profits either for themselves or third parties. This was achieved due to exact timing of the execution of foreign exchange trades around the fixing window. The WMR 4pm fix, for instance, could be influenced by concentrating the bank's own pre-positioning trades around the time slots just before or after the fix time slot. Depending on their risk appetite, traders would trade closer or further away from the fix time slot.

293. In addition:

[UBS] repeatedly and unacceptably often acted against their clients' and counterparties' interests, particularly by: (i) triggering ("jamming") of stop loss orders where client stop orders were actively triggered to the bank's advantage, (ii) front running client orders by executing aligned orders in advance, (iii) partial fills where at least a part of the client's profitable transaction in foreign exchange was credited to the bank, (iv) disclosure of confidential client information, (v) condoning actions in bad faith by third parties, (vi) occasional deceptive acts with regard to sales mark-ups, as well as excessive mark-ups associated with one of the bank's products.

294. FINMA ordered that UBS take extensive corrective measures, including by strengthening its compliance function, limiting and monitoring certain communication media, prohibiting certain employee transactions, mandating regular internal audits, and strengthening the whistle-blowing process.

295. In a later investigation made public on December 17, 2015, FINMA found that six managers and traders formerly employed by UBS in the FX market "bore significant responsibilities for the serious organisational shortcomings and improper conduct at UBS."¹⁸⁷ The investigation established that those responsible for managing UBS's FX trading knew of and at times tolerated improper behaviors that was counter to their clients' interests. In particular, they knew of the collusive chat rooms but failed to control their use or implement any safeguards to ensure compliance with any controls. The traders had repeatedly attempted to manipulate the FX market; in particular, they had exchanged confidential client information, deliberately

¹⁸⁷ FINMA Press Release, *Foreign Exchange Manipulation: FINMA issues six industry bans* (Dec. 17, 2015), <https://www.finma.ch/en/news/2015/12/20151217-mm-devisenhandel/>.

triggered stop-loss orders, and engaged in front running. Ultimately, the six guilty individuals were issued industry bans. The two global heads of UBS's foreign exchange trading and foreign exchange spot trading were banned from holding senior management positions for four and five years; according to industry insiders, Niall O'Riordan, former global head of forex spot trading, and Chris Vogelesang, former global head of forex traders, were banned by FINMA.¹⁸⁸ An additional four traders, who worked at UBS's spot trading desk, were prohibited for one year from working in the industry.

7. The DFS Orders on Barclays, BNP Paribas, Credit Suisse, Deutsche Bank, and Goldman Sachs

296. The New York Department of Financial Services ("DFS") regulates banks licensed to do business in New York. The DFS reportedly investigated a dozen banks for their role in manipulating the FX market.¹⁸⁹ In addition to misconduct by individual traders in electronic chat rooms, the DFS investigated whether the banks used algorithms on their electronic trading platforms to manipulate FX prices. The DFS initially focused its investigation on Defendants Barclays and Deutsche Bank, and installed specialist advisory firms as monitors at both of those banks.¹⁹⁰

¹⁸⁸ Ralph Atkins and Gina Chon, *Swiss watchdog bans ex-UBS workers over forex manipulation*, Financial Times (Dec. 17, 2015), <https://next.ft.com/content/81855cd4-a49b-11e5-8218-6b8ff73aae15>.

¹⁸⁹ Greg Farrell, *Lawsky Said to Probe Barclays, Deutsche Bank FX Algorithm*, Bloomberg (Dec. 10, 2014), <http://www.bloomberg.com/news/articles/2014-12-10/ny-regulator-said-to-probe-deutsche-bank-barclays-fx-algorithms>.

¹⁹⁰ Karen Freifeld, *NY monitor in Deutsche to probe possible forex rigging*, Reuters (Feb. 9, 2015), <http://www.reuters.com/article/2015/02/09/deutsche-monitor-forex-idUSL1N0VJ1Q220150209>.

297. In December 2014, the DFS expanded its probe by also serving subpoenas on Defendants BNP Paribas, Societe Generale, Credit Suisse, and Goldman Sachs.¹⁹¹ Those Defendants produced responsive information beginning in January 2015, including transcripts of traders discussing the manipulation of algorithms.

298. On May 20, 2015, the DFS announced a Consent Order against Barclays for “engag[ing] in manipulative conduct and attempt[ing] to manipulate benchmark foreign exchange (FX) rates around the world, during at least 2008 through 2012, to benefit Barclays’ own trading positions.”¹⁹² This includes instances where “Barclays conspired with other banks in order to coordinate trading, attempt to manipulate exchange rates, or coordinate bid/ask spreads charged.” For instance, the DFS revealed specific examples of Barclays traders coordinating with traders at Defendants HSBC and Citi to manipulate prices.

299. The DFS described Barclays’ conduct as “a brazen ‘heads I win, tails you lose’ scheme to rip off their clients,” and confirmed that Barclays traders communicated in electronic chat rooms described above, such as the “Cartel,” and used various manipulative tactics, including “building ammo” and “clear[ing] the decks.” The DFS also provides many specific examples of manipulation, as well as damning admissions from Barclays traders and executives, including a statement regarding the bank’s FX transactions from the former Vice President in Barclays’ New York branch: “if you ain’t cheating, you aint trying.”

300. The DFS also found that Barclays had conspired with other banks to manipulate certain emerging currency market from at least 2009 to 2012. For example, a Barclays trader

¹⁹¹ Karen Freifeld, *NY financial regulator subpoenas banks in forex probe*, Reuters (Feb. 10, 2015), <http://www.reuters.com/article/2015/02/10/usa-banks-probes-idUSL4N0VK61V20150210>.

¹⁹² DFS Press Release, *NYDFS Announces Barclays to Pay \$2.4 Billion, Terminate Employees for Conspiring to Manipulate Spot FX Trading Market* (May 20, 2015), <http://www.dfs.ny.gov/about/press/pr1505201.htm>.

and a JP Morgan trader coordinated the prices offered for USD/South African Rand to a particular customer. The Barclays trader stated that “if you win this we should coordinate you can show a real low one and will still mark it little lower haha.” After the JP Morgan trader suggested that they “prolly shudnt put this on perma chat,” the Barclays trader responded “if this is the chat that puts me over the edge than oh well. much worse out there.”¹⁹³

301. As a result of the Order, Barclays agreed to pay the DFS a civil penalty of \$485 million, and to terminate certain employees who played a role in FX manipulation. The DFS later announced that Barclays would pay an additional penalty and fire an additional employee for misconduct related to their “Last Look” system and automated, electronic trading in the FX market. The DFS ordered Barclays to pay \$150 million as a penalty for their misconduct and to terminate David Fotheringham, its Global Head of Electronic Fixed Income, Currencies, and Commodities (eFICC) Automated Flow Trading.¹⁹⁴ Mr. Fotheringham later brought suit against Barclays claiming that he was unfairly dismissed. In finding that Mr. Fotheringham was only 20% responsible for his dismissal, the London court stated that his managers knew he was abusing the “Last Look” system to make money for the bank at the expense of its customers, and they approved of it.¹⁹⁵

302. On May 24, 2017, the DFS announced that it entered into a consent order with BNP Paribas in which the bank would pay a \$350 million fine “for significant, long-term

¹⁹³ Consent Order at ¶ 34, *In the Matter of Barclays Bank PLC, et al.* (May 20, 2015), <http://www.dfs.ny.gov/about/ea/ea150520.pdf>.

¹⁹⁴ Consent Order at ¶ 44, *In the Matter of Barclays Bank PLC, et al.* (Nov. 17, 2015), <http://www.dfs.ny.gov/about/ea/ea151117.pdf>.

¹⁹⁵ Kaye Wiggins, *Ex-Barclays FX Trader Wins Employment Lawsuit*, Bloomberg (Mar. 19, 2018), <https://www.bloomberg.com/news/articles/2018-03-19/ex-barclays-fx-trader-wins-employment-lawsuit-as-bank-criticized>.

violations of New York banking law arising out of the [b]ank's foreign-exchange business.”¹⁹⁶ DFS found that the bank's improper conduct, which lasted from 2007 to 2013, included “collusive activity by foreign exchange traders to manipulate foreign exchange currency prices and foreign exchange benchmark rates; executing fake trades to influence the exchange rates of emerging market currencies; and improperly sharing confidential customer information with traders at other large banks.” The consent order also revealed that BNP Paribas traders in Tokyo developed a code for exchanging secret information and colluding, and the bank's last look functionality improperly disadvantaged customers.

303. The DFS detailed the following kinds of misconduct at BNP Paribas:

- Collusive conduct carried out through online chatrooms, including the execution of fake trades to manipulate prices and widen spreads.
- Improper sharing of confidential information to maximize profits at customers' expense.
- Manipulation of benchmark rates from collusive trading activity as well as improper submission to benchmark-fixing bodies.

304. The Consent Order¹⁹⁷ described the efforts of Jason Katz—who pleaded guilty to criminal antitrust violations in January 2017—to recruit traders to his “cartel,” the chatroom ZAR Domination, in which they discussed strategies to manipulate the South African Rand (ZAR). For example, in January 2012, Katz contacted a trader at a large African bank saying “a couple of us here fin New York] are going to probably make a run at zar in this [Eastern] time zone.” Katz wanted to enlist the African trader, proposing that “some coordination with you

¹⁹⁶ DFS, Press Release, *DFS Fines BNP Paribas \$350 million for illegal, unsafe and unsound conduct in connection with BNPP's foreign exchange trading business* (May 24, 2017), <http://www.dfs.ny.gov/about/press/pr1705241.htm>.

¹⁹⁷ DFS, Consent Order, *In the Matter of BNP Paribas S.A., et al.* (May 24, 2017), <http://www.dfs.ny.gov/about/ea/ea170524.pdf>.

guys ... let you know what we are doing and what we have ... do some execution in the overnight hours.” The goal in recruiting additional traders was to build up “a lot of firepower” for coordinated trading.

305. On November 13, 2017, DFS announced a consent order with Credit Suisse in which it found that Credit Suisse had, from at least 2008 to 2015, engaged in improper, unsafe, and unsound conduct, by failing to implement effective controls over its FX business.¹⁹⁸ As part of this Order, Credit Suisse was to pay a penalty of \$135 million. By failing to implement effective oversight, Credit Suisse allowed its traders to engage in “inappropriate sharing of information with other global banks, which may have led to coordinated trading, manipulation of exchange rate, and increased bid/ask spreads offered to customers in Credit Suisse’s foreign exchange business.” Credit Suisse’s did so in multi-party electronic chat rooms “[f]or many years.” DFS also found that from April 2010 to June 2013, Credit Suisse used algorithms to front-run its customers’ limit and stop-loss orders. Finally, DFS found that from January 2012 to 2015, Credit Suisse improperly used its trading platform’s “Last Look” functionality to increase profit on customer orders, and made “inadequate and potentially misleading disclosures to customers about the existence and extent of Last Look.”

306. The DFS Order detailed numerous instances in which Credit Suisse traders shared confidential customer information with other banks, including by using derogatory nicknames, like “Satan,” or “Shoefone.” And like Barclays, the traders at Credit Suisse built “ammo” around the fixing window to push the price of a currency pair in the direction desired by the traders.

¹⁹⁸ Consent Order, *In the Matter of Credit Suisse AG, et al.* (Nov. 13, 2017), <http://www.dfs.ny.gov/about/ea/ea171113.pdf>.

307. On May 1, 2018, DFS announced a consent order with Goldman Sachs in which it found that Goldman Sachs had, from at least 2008 to early 2013, engaged in improper, unsafe, and unsound conduct, by failing to implement effective controls over its FX business.¹⁹⁹ As part of this Order, Goldman Sachs was to pay a penalty of \$54.75 million. The DFS found that a Goldman Sachs traders participated in electronic chat rooms with traders from other banks “where participants improperly shared confidential customer information,” such as specific trades undertaken by such customers, and “discussed trading activity that, if acted upon, could improperly affect currency prices.” Traders in these chat rooms used code words to discreetly share confidential customer information, referring to certain customers as the “fiddler,” “hat and coat,” “dodgy aussie seller,” and “Satan.” The DFS Order also references traders at several banks, including Goldman Sachs, colluding on bid/ask spreads. Indeed, a trader at a “global bank” suggested to colleagues in a chat room: “lets sign a pact . . . on spreads.” “Trader 1”, a Goldman Sachs trader in the chat room, quickly responded, “Agree.”

308. The DFS Order detailed numerous instances in which a Goldman Sachs trader, referred to as “Trader 1,” shared confidential customer information with other banks and colluded with other traders to manipulate benchmark fixes and FX spot prices and spreads.

309. For instance, in a chat from April 2008, Trader 1 reported to a trader at another bank, “pleeease stay down here usd cad hahaha used up a fair bit of ammo.” Then, in another chat from August 2012, Trader 1 wrote to two FX traders at other banks, “can we get kiwi lower please.”

310. The DFS Order recounts an episode in mid-2009 when “Salesperson 1,” a senior member of Goldman Sachs’ Global FX Sales Division located in the London office, raised

¹⁹⁹ DFS, Consent Order Against Goldman Sachs (May 1, 2018), available at <http://www.dfs.ny.gov/about/ea/ea180501.pdf>.

concerns about the sharing of confidential customer information in an email to “Trader 1,” writing:

I would like you guys to give it some thought first please. The question stands: “Why do the people that you talk to seem to give you so much clearly improper information week after week, month after month, and year after year? . . . Are they stupid? Are they getting something from you by keeping you engaged? Are they very poorly trying to impress you to get hired?” . . . I am working under the assumption that they are getting something or they would not keep doing it, so I believe it is worthwhile our stepping back and making sure that we are not showing our hands in some way that might not be obvious . . . This is far from the first time that I have raised this issue FYI . . .²⁰⁰

The Order goes on to note that no evidence was found indicating that Salesperson 1 took any steps to the escalate the matter to Goldman Sachs’ compliance department.

311. As another example of improper conduct detailed in the DFS Order, in October 2011 another Goldman Sachs FX trader, “Trader 6,” received “improperly shared customer information” from “Trader 11,” a trader at a “large Middle Eastern Bank.” In exchange, Trader 6 told Trader 11 that he was “just hearing decent buying expected at 4pm fix, so maybe keep ammo dry.”

312. In April 2012, “Trader 12” and “Trader 13,” two Goldman Sachs FX traders specializing in emerging market currencies, discussed how easy it was for them to manipulate FX prices, with Trader 12 stating that “the first thing I did this mng is sell all my long usd and turn short . . . then I put out a rec to sell usdmyr . . . then it collapsed.” He went on to state that “the good thing about EM . . . your recs can move the market.”

313. In addition to ordering Goldman Sachs to pay a \$54.75 million penalty, the DFS Order prohibited Goldman Sachs from employing “Trader 1” in the future.

²⁰⁰ *Id.* at 6.

314. On June 20, 2018, DFS announced a consent order with Deutsche Bank in which it found that Deutsche Bank had engaged in “unsafe, unsound and improper conduct” arising from Deutsche Bank’s “failures to implement effective controls over its FX business.”²⁰¹ Moreover, Deutsche Bank’s management “failed to effectively supervise the FX business and ensure compliance with applicable rules, regulations, and laws.”²⁰² As part of this Order, Deutsche Bank was to pay a penalty of \$205 million.

315. Specifically, the improper tactics used by Deutsche Bank traders and salespeople included: (1) using online chat rooms to coordinate FX price manipulation and benchmark-fixing with traders at other banks, and to exchange confidential customer information with such traders; (2) attempting to “improperly influence the submissions made by Deutsche Bank and other banks to submission-based foreign currency benchmarks in certain emerging market currencies”; (3) an effort, co-led by a Deutsche Bank trader, to collude with traders at other banks in the bid/offer spreads offered to FX customers for FX non-deliverable forward contracts in an emerging market currency”; and (4) “[a]ggressive trading intended to move prices in certain emerging market currencies, so to improperly trigger or defend FX barrier options, to the Bank’s benefit and the customers’ detriment.”

316. The DFS Order detailed numerous instances in which Deutsche Bank traders colluded to manipulate FX prices. For example, in May 2010, “Trader 1,” a senior trader on Deutsche Bank’s New York trading desk, after hearing about the outcome of a particular trade resulting from “inappropriate coordination” by Matthew Gardiner, a former UBS and Barclays trader, and a trader at “another large bank,” wrote to Mr. Gardiner in a chat room: “that’s what

²⁰¹ N.Y. State Dep’t of Fin. Servs., Consent Order Against Deutsche Bank (June 20, 2018), available at <https://www.dfs.ny.gov/about/ea/ea180620.pdf>.

²⁰² *Id.* at 27.

we need to do more!!! ... you and me – coordinate ... LETS GO.” Mr. Gardiner responded: “yeah I’m fully up for co-ordinated rippage.”²⁰³

317. In July 2010, Trader 1 coordinated with Mr. Gardiner “to sell substantial amounts of euro/U.S. dollar in the minutes just prior to the [ECB] fix, so to try to move the price down.” Just after the fix, Mr. Gardiner exclaimed to Trader 1, “aaawwww yeah ... the power of 2!!” Trader 1 ultimately booked more than \$81,000 in profit on this trade.

318. Then in September 2010, Trader 1 informed Mr. Gardiner that he had a customer order to buy 300 million EUR/USD at the upcoming WMR fix, and that Deutsche Bank’s London desk had additional customer buy orders for this currency pair. Mr. Gardiner then passed along to Trader 1 confidential customer order information that he had received from two other traders at large banks, namely, that these two other traders had aggregate total buy orders of more than 600 million euro. Trader 1 cautioned Mr. Gardiner that he was sharing this information on a “LKB,” i.e., “low key basis,” and remarked that “[t]his cant be that easy.” Approximately one month later, Deutsche Bank promoted Trader 1 to Head of the New York FX trading desk.²⁰⁴

319. Other Deutsche Bank traders engaged in similar improper tactics to manipulate benchmark fixes. For instance, a Deutsche Bank London-based FX trader discussed manipulating benchmark fixes with a Deutsche Bank New York-based FX trader. The London trader expressed his preference for manipulating the ECB fix because “it is really just like driving a forklift truck into a wall ... sometimes the cash machine falls onto the truck.”²⁰⁵

²⁰³ *Id.* at 6.

²⁰⁴ *Id.* at 7.

²⁰⁵ *Id.* at 8.

320. In a July 2010 internal communication, a Deutsche Bank derivatives trader noted to a supervisor in Deutsche Bank's FX Derivatives Department that Deutsche Bank's spot traders "like big fixes ... since they can push mkt in their favor." The supervisor responded: "yes ... big fixes always good."

321. The DFS Order also details how a Deutsche Bank salesperson based in Frankfurt, Germany coordinated with Trader 1 to drive down the price of EUR/USD during a brief period before and after the Bloomberg FX fix ("BFIX") at the request of a client of the Bank.²⁰⁶ The DFS found that its analysis of Deutsche Bank's trading records indicated "a distinct possibility Trader 1's market activity moved the price of the Euro down during a brief period before and after the BFIX fix that day."

322. The DFS Order also details how in November 2009, a New York-based Deutsche Bank trader used a chat room known as "Butter the Comedian" to organize a scheme "whereby major dealers in certain non-deliverable forwards ('NDFs') tied to the Brazilian real/U.S. dollar currency pair agreed to quote inflated spreads to any outside party seeking to do business...."²⁰⁷ The traders discussed how wide the spread should be, and ultimately agreed on an additional plus or minus 5 pip spread.

323. The DFS also found possible coordination between Deutsche Bank traders and traders at other major banks on the spread charged on the EUR/USD currency pair. In September 2008, a New York-based Deutsche Bank trader confirmed to a trader at a rival bank

²⁰⁶ The BFIX is a fix provided by Bloomberg LP, and is described as a family of benchmarks that covers spot, forward and non-deliverable forward rates for many global currencies. "The benchmark is used by market participants as a fix for portfolio benchmarking, derivatives valuation, index construction, and trade execution." Bloomberg FX Fixings, Bloomberg, <https://www.bloomberg.com/professional/product/indices/bfix/>.

²⁰⁷ N.Y. State Dep't of Fin. Servs., Consent Order Against Deutsche Bank at 9 (June 20, 2018), <https://www.dfs.ny.gov/about/ea/ea180620.pdf>.

in a chat room that the “consensus” spread that they were showing the customers was “at least 10.” The “rival” trader responded: “Yeah I think it’s at least 10 as well.”

324. In January 2009, a London-based Deutsche Bank trader was asked by a trader at another global bank how wide the spread was on the Australian dollar. The Deutsche Bank trader responded by disclosing several AUD price quotes he had shown his customers in recent weeks, and stated “so [I’m] thinking 50-60 ... does that sound right?” The other trader replied “yup I said 60,” and asked the Deutsche Bank trader to keep that information to herself. The Deutsche Bank trader responded: “I consider these chats on spreads sensitive and btwn us girls for all the obvious reasons all agreed.”²⁰⁸

325. The DFS Order also identified numerous occasions in which Deutsche Bank traders manipulated the prices and fixes of emerging market currencies. For example, the DFS found that “on more than 50 occasions over several years,” two New York-based Deutsche Bank traders requested a Bank employee in Buenos Aires to skew the Bank’s submissions to an Emerging Markets Trading Association (“EMTA”) benchmark fix on the Argentine peso/USD currency pair to help the traders’ positions. Such requests “were periodically honored.”²⁰⁹ The traders’ supervisor was aware of the benchmark rigging, but the DFS found no evidence indicating that the supervisor informed Deutsche Bank’s Compliance department about this improper conduct.

326. Further, between 2010 and 2012, two other Deutsche Bank traders based in London and Moscow coordinated with traders at other banks using chat rooms to rig EMTA submissions in order to benefit Deutsche Bank’s trading positions. The DFS found indications

²⁰⁸ *Id.* at 11.

²⁰⁹ *Id.* at 12.

that “many of these efforts to influence other submissions or to coordinate submissions were successful.”²¹⁰

327. The DFS also identified numerous instances in which Deutsche Bank traders and salespeople improperly exchanged confidential customer information with competitors at other banks. For instance, in November 2010, a trader at a competitor bank asked a London-based Deutsche Bank trader over chat to identify a particular customer who made a trade request. The London trader, in an effort to avoid detection, identified the customer by “typing the three-letter name of this Fortune 500 company in three separate responses, hitting the return key each time after each letter.”

328. Deutsche Bank traders also used confidential customer order information to front-run trades. For example, in July 2012, a Deutsche Bank New York-based salesperson notified two Deutsche Bank New York-based traders that a customer was preparing to place a 1 billion GBP buy order against the U.S. dollar. Unbeknownst to the salesperson, after receiving this information, the two traders acquired approximately 500 million pound sterling, which likely drove up the price of the GBP/USD currency pair. The price increase “spooked the customer into refraining from trading at that moment,” and when the customer decided to executed the trade several days later it was forced to pay an additional \$17 million to have the identical order filled.²¹¹

329. Deutsche Bank traders also disadvantaged Bank customers by “trading aggressively to trigger or defend a barrier option that had been purchased by a customer.”²¹² For

²¹⁰ *Id.* at 13.

²¹¹ *Id.* at 15.

²¹² As explained in the Deutsche Bank DFS Order, “[o]ne type of barrier option, known as a ‘knock-out’ option, yields value to the customer only if the referenced currency pair does not reach a specified price in the market during a certain time period.” *Id.*

example, on April 16, 2009, two New York-based Deutsche Bank traders “aggressively purchased \$300 million worth of U.S. dollars against the Mexican peso, in an effort to prop up the spot price of this currency pair.” Their motive is evident from a chat message sent from one trader to the other: “We r defending the 13.00 barrier in mxn. we r already over 300 mios usdmxn long now. working to sell and work bids again.” These traders succeeded in generating a “hefty profit” for the Bank at customer expense.

330. The DFS also uncovered in its investigation that from 2012 until late 2013, Deutsche Bank implemented a “Pre-Hedging Feature” in its Last Look system which, on more than 1,300 occasions, caused the Bank to trade ahead of customer orders.²¹³

8. The Federal Reserve Board Orders on BofA, Barclays, BNP Paribas, Citi, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan, RBS, and UBS

331. The Federal Reserve Board announced in November 2014 that it had begun to investigate improper conduct in the FX markets, and was working closely with the DOJ and other authorities.²¹⁴ On May 20, 2015 (the same day that the DOJ announced that major banks had pled guilty to criminal misconduct), the Federal Reserve Board announced that it had imposed more than \$1.8 billion in fines on six major banking organizations “for their unsafe and unsound practices in the foreign exchange markets.” In a press release, the Federal Reserve Board noted that UBS, Citigroup, JPMorgan, and Barclays had engaged in unsafe and unsound conduct in multi-bank chat room communications, consisting of: “(i) disclosures to traders of other institutions of confidential customer information of the Bank and the Branch; (ii) agreements with traders of other institutions to coordinate FX trading in a manner designed to

²¹³ *Id.* at 25-26.

²¹⁴ Doina Chaicu, *U.S. Federal Reserve investigating bank conduct in forex markets*, Reuters (Nov. 12, 2014), <http://www.cnbc.com/id/102176829>.

influence the WMR, ECB, and other FX benchmark fixes and market prices generally; (iii) trading strategies that raised potential conflicts of interest; and (iv) possible agreements with traders of other institutions regarding bid/offer spreads offered to FX customers.”²¹⁵ These fines were among the largest ever by the Federal Reserve Board, and included: \$342 million each imposed on UBS, Barclays, Citigroup, and JPMorgan; \$274 million on RBS; and \$205 million on Bank of America. The fines were accompanied by cease-and-desist orders that required the firms to improve their oversight and institute controls over activities in the FX market.²¹⁶

332. On April 20, 2017, the Federal Reserve Board issued an additional Order to Cease and Desist and Order of Assessment of a Civil Monetary Penalty against Deutsche Bank AG, DB USA Corporation, and Deutsche Bank AG New York Branch. The Federal Reserve Board found that Deutsche Bank had deficient policies and procedures “which prevented it from detecting and addressing unsafe and unsound conduct by certain of its FX traders,” including in communications by traders in multibank chatrooms, consisting of “disclosures of trading positions, and, on some occasions, discussions of coordinated trading strategies with traders of

²¹⁵ Federal Reserve Board Press Release, *Federal Reserve announces fines totaling more than \$1.8 billion against six major banking organizations for their unsafe and unsound practices in the foreign exchange (FX) markets* (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/enforcement20150520a.htm>.

²¹⁶ Order to Cease and Desist, *In the Matter of UBS AG, et al.*, Dkt. No. 15-005 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a6.pdf>; Order to Cease and Desist, *In the Matter of Barclays Bank PLC, et al.*, Dkt. No. 15-006 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a3.pdf>; Order to Cease and Desist, *In the Matter of The Royal Bank of Scotland PLC, et al.*, Dkt. No. 15-007 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a4.pdf>; Order to Cease and Desist, *In the Matter of Citigroup Inc.*, Dkt. No. 15-008 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a5.pdf>; Order to Cease and Desist, *In the Matter of JPMorgan Chase & Co.*, Dkt. No. 15-009 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a2.pdf>; Order to Cease and Desist, *In the Matter of Bank of America Corp.*, Dkt. No. 15-010 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a1.pdf>.

other institutions;” “discussions about possible FX benchmark fix related trading with traders of other institutions;” “attempts to influence contributions to submission-based foreign currency benchmarks in certain emerging market currencies in order to possibly benefit Deutsche Bank, both within Deutsche Bank and with traders of other institutions;” “discussions by a Deutsche bank trader regarding bid/offer spreads offered to FX customers for FX non-deliverable forward contracts with traders of other institutions in an emerging market currency;” and “discussions on trading in a manner to trigger or defend certain FX barrier options within Deutsche Bank, in order to benefit Deutsche Bank.”²¹⁷

333. The Federal Reserve Board fined Deutsche Bank \$136,950,000. Deutsche Bank was further ordered to “fully cooperate with and provide substantial assistance to” the Federal Reserve Board in investigating whether separate enforcement actions should be taken against individuals who were affiliated with Deutsche Bank and “who were involved in the misconduct underlying” the order.

334. On July 17, 2017, the Federal Reserve Board entered an Order to Cease and Desist and an Order of Assessment of a Civil Monetary Penalty Issued Upon Consent against BNP Paribas. The Federal Reserve Board found that BNPP had deficient policies and procedures which prevented BNPP from detecting and addressing unsafe and unsound conduct by its FX traders, including in communications by traders in multibank chatrooms, consisting of:

- (i) disclosures of trading positions and discussions of coordinated trading strategies with traders of other institutions; (ii) discussions about anticipated FX benchmark fix-related trading and submissions with traders of other institutions; (iii) disclosures to traders of other institutions of confidential customer information of BNPP; (iv) discussions regarding bid/offer spreads offered to FX customers with traders of other institutions; and (v) discussions of trading in a

²¹⁷ Order to Cease and Desist, *In the Matter of Deutsche Bank AG, et al.*, Dkt. No. 17-008 (Apr. 20, 2017), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20170420a1.pdf>.

manner to trigger or defend certain FX barrier options within BNPP, in order to benefit BNPP.²¹⁸

335. The Federal Reserve Board fined BNPP \$246,375,000 for this conduct.

336. On September 29, 2017, the Federal Reserve Board entered an Order to Cease and Desist and Order of Assessment of a Civil Money Penalty Issued Upon Consent against HSBC. The Federal Reserve Board found that HSBC's had deficient policies in place which permitted its FX traders to routinely communicate with FX traders at other financial institutions through chatrooms, and the Federal Reserve Board found the following unsafe and unsound practices:

(i) two of its senior traders, including the Bank's global head of FX cash trading, misusing confidential inside information to conduct FX trades in a manner that benefitted them and their trading desk to the detriment of HBEU's corporate client, which resulted in the traders' indictment by a federal grand jury on multiple counts of wire fraud and conspiracy to commit wire fraud, *United States v. Johnson*, No. 1:16-cr-457, Dkt 9 (E.D.N.Y. Aug. 16, 2016); (ii) possible agreements with traders of other institutions to coordinate FX trading in a manner designed to influence benchmark fixes and market prices generally; (iii) attempts to influence contributions to a submission-based foreign currency benchmark in a certain emerging market currency in order to possibly benefit HSBC; (iv) trading strategies that raised potential conflicts of interest; and (v) disclosures to traders of other institutions of confidential information of HSBC.

337. The Federal Reserve Board fined HSBC \$175,296,000 for this conduct.²¹⁹

338. On May 1, 2018, the Federal Reserve Board entered an Order to Cease and Desist and Order of Assessment of a Civil Money Penalty Issued Upon Consent against Goldman Sachs.²²⁰ The Federal Reserve Board found that Goldman Sachs had deficient policies and

²¹⁸ Order to Cease and Desist, *In the Matter of BNP Paribas S.A., et al.*, Dkt. No. 17-020 (Jul. 17, 2017), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20170717a1.pdf>.

²¹⁹ Order to Cease and Desist, *In the Matter of HSBC Holdings PLC, et al.*, Dkt. No. 17-010 (Sept. 29, 2017), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20170929a1.pdf>.

²²⁰ Order to Cease and Desist, *In the Matter of The Goldman Sachs Group, Inc.*, Dkt. No. 18-015 (May 1, 2018), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20180501b1.pdf>.

procedures in place which permitted its FX traders to routinely communicate with FX traders at other financial institutions through chatrooms. In particular, the Federal Reserve Board found that Goldman Sachs FX traders engaged in “potentially unsafe and unsound conduct” with traders at other financial institutions, including: (1) disclosing confidential customer information; (2) discussing “anticipated FX benchmark fix-related trading”; (3) discussing “bid/offer spreads offered to FX customers”; and (4) “trading strategies that raised potential conflicts of interest.”

339. The Federal Reserve Board fined Goldman Sachs \$54,750,000 for this conduct.

9. Federal Reserve Board Bans and Suspensions of individuals

340. On July 19, 2016, the Federal Reserve Board took further action against an individual trader by imposing a lifetime ban on former UBS and Barclays trader Matthew Gardiner from participating in the banking industry.²²¹ The Federal Reserve Board found that Mr. Gardiner “used electronic chat rooms to coordinate FX trading, facilitate manipulation of FX benchmarks, disclose confidential customer information to traders at other organizations, and engage in other unsafe and unsound practices.”

341. On August 29, 2016, the Federal Reserve Board issued a similar order against Christopher Ashton, Barclays’s former Head of the FX Spot Desk in London and Global Head of FX Spot Business.²²² The Federal Reserve Board found that Mr. Ashton used chat rooms to exchange confidential client information with competitors (including stop-loss orders) and then worked with those competitors to coordinate their collective trading to manipulate the FX benchmarks. Barclays had suspended Mr. Ashton in November 2013 and then terminated his

²²¹ Federal Reserve Board Press Release (July 19, 2016), <http://www.federalreserve.gov/newsevents/press/enforcement/20160719a.htm>.

²²² Federal Reserve Board Press Release (Aug. 29, 2016), <http://www.federalreserve.gov/newsevents/press/enforcement/20160829a.htm>.

employment in May 2015. The Federal Reserve Board sought a permanent ban on Ashton from employment in the banking industry, and a \$1.2 million fine. In May 2017, the Federal Reserve Board applied the \$1.2 million fine and permanently banned Ashton from participating in the banking industry after Ashton failed to respond to the allegations.²²³

342. On July 24, 2017, the Federal Reserve Board banned Michael Weston, a former Barclays trader, from the banking industry. The Federal Reserve Board found that from January 2011 to October 2012, Weston “routinely communicated with other foreign exchange . . . traders at other financial institutions through chatrooms on electronic messaging platforms” and while doing so “engaged in unsafe and unsound conduct” consisting of “disclosures to traders of other institutions of confidential information of Barclays and its customers” and “possible coordination of the trading of certain currency pairs in connection with FX currency benchmarks or “fixes” set by World Markets/Reuters and the European Central Bank with traders of other institutions.”²²⁴

343. On February 16, 2018, the Federal Reserve Board announced that it was seeking to permanently ban Peter Little, a former Barclays trader who led the FX spot desk in New York, from the U.S. banking industry, and that it also sought to impose a \$487,500 fine against Mr. Little. The Federal Reserve Board found that Mr. Little “engaged in unsafe and unsound practices and breaches of fiduciaries duties” related to “manipulative and collusive trading” in the FX market, including “coordinating with competitors to manipulate FX currency benchmarks” and “failing to supervise other traders who [] coordinated with competitors to

²²³ Cara Mannion, *Ex-Barclays Forex Trader Gets \$1.2M Fine, Industry Ban*, Law360, <https://www.law360.com/articles/926431/ex-barclays-forex-trader-gets-1-2m-fine-industry-ban> (May 19, 2017).

²²⁴ Order of Prohibition, *In the Matter of Michael Weston*, Dkt. No. 17-019 (Jul. 24, 2017, <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20170724a1.pdf>).

manipulate FX currency benchmarks,” “engaged in trading practices detrimental to clients,” and “improperly disclosed confidential proprietary and client information to competitors.”²²⁵

10. The European Commission investigation

344. The European Commission (“EC”) is the European Union body responsible for proposing and enforcing the laws of the EU. In October 2013, EC Competition Commissioner Joaquin Almunia reported that he had recently learned of activities that “could mean violation of competition rules around the possible manipulation of types of exchange rates,” and that the EC had begun an investigation into that misconduct.²²⁶

345. In June 2014, Almunia confirmed that the investigation was still ongoing and in its preliminary stages. Almunia stated that “there is a lot of information and we are digging into the information and analyzing it and discussing it.”²²⁷ Around October 2014, the EC reportedly expanded its probe by seeking FX traders’ communications through Facebook and other social media platforms, in addition to their emails and electronic chat room logs.²²⁸

346. In June 2016, Bloomberg reported that “[t]he European Union is stepping up its currency rigging probe more than a year after U.S. and U.K. regulators issued multi-billion dollar

²²⁵ Notice of Intent to Prohibit, *In the Matter of Peter Little*, Dkt. No. 18-010 (Feb. 16, 2018), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20180216a1.pdf>.

²²⁶ Aoife White and Gaspard Sebag, *EU Regulators Start Inquiry Into Currency Rate-Manipulation*, Bloomberg (Oct. 7, 2013), <http://www.bloomberg.com/news/articles/2013-10-07/eu-starting-inquiries-into-currency-manipulation-almunia-says>.

²²⁷ Huw Jones, *EU’s Almunia says nothing new yet on forex, Swiss benchmark rate probes*, Reuters (Jun. 5, 2014), <http://www.reuters.com/article/2014/06/05/eu-almunia-idUSL6N00M2PP20140605>.

²²⁸ Aoife White and Gaspard Sebag, *FX Traders’ Facebook Chats Said to be Sought in EU Probe*, Bloomberg (Oct. 27, 2014), <http://www.bloomberg.com/news/articles/2014-10-27/fx-traders-facebook-chats-said-to-be-sought-in-eu-probe>.

finances to global banks.”²²⁹ Noting that “the commission is used to being late to the party,” and that “[r]egulators may need several more years to finalize the antitrust investigation,” Bloomberg reported that the commission may be proceeding very carefully.²³⁰

347. In November 2017, the Financial Times reported that UBS, RBS, JP Morgan, Citi, Barclays, HSBC and two other banks were “gearing up to negotiate settlements” with the EC, which were likely to cost the banks “billions of euros combined.”²³¹

348. On July 31, 2018, Credit Suisse disclosed in its quarterly report that it had been charged with “engag[ing] in anti-competitive practices in connection with its foreign exchange trading business” by EU antitrust regulators.²³² Credit Suisse is expected to challenge the EU regulators’ findings in court. Upon information and belief, the European Commission’s investigation is ongoing.

11. The CADE (Brazil) Settlements

349. On December 9, 2016, the Tribunal of the Administrative Council for Economic Defense (“CADE”), a Brazilian authority, announced that it had signed Cease and Desist Agreements (or “TCCs”) with five banks that settled charges concerning those banks’ manipulation of the FX market.²³³ The Defendant banks settling with CADE are Barclays, Citi,

²²⁹ Gaspard Sebag and Stephanie Bodoni, *FX Probe Said to Emerge From Shadows as EU Seeks Bank Data*, Bloomberg (Jun. 3, 2016), <https://www.bloomberg.com/news/articles/2016-06-03/currency-probe-said-to-emerge-from-shadows-as-eu-seeks-bank-data>.

²³⁰ *Id.*

²³¹ Rochelle Toplensky and Martin Arnold, *Banks Prepare to Settle With Brussels Over Forex Cartel Probe*, Financial Times (Nov. 19, 2017), <https://www.ft.com/content/860f43c4-cacc-11e7-ab18-7a9fb7d6163e>.

²³² Aoife White, *Credit Suisse Gets EU Antitrust Complaint in FX Probe*, Bloomberg, (Jul. 31, 2018), <https://www.bloomberg.com/news/articles/2018-07-31/credit-suisse-gets-eu-antitrust-complaint-in-fx-rigging-probe>.

²³³ CADE Press Release, *CADE signs five agreements regarding a cartel investigation in the foreign exchange market and opens a new cart investigation in the Brazilian exchange*

Deutsche Bank, HSBC, and JP Morgan. The TCCs covered charges that the Defendant banks had conspired to manipulate FX benchmarks, including the WM/Reuters and ECB rates. These five Defendants were fined a combined \$54 million.

350. The General Superintendent of CADE had initiated proceedings against the five Defendants, among other banks, in July of 2015. The investigation uncovered conclusive evidence of anticompetitive conduct in the FX market. CADE uncovered evidence that the banks communicated via chatrooms to coordinate their FX exchange transactions, and colluded to fix prices. The anticompetitive behavior included sharing confidential client information, including risk positions, prospective transactions, and other details regarding client matters. This conduct, CADE concluded, resulted in the banks operating as one actor in the FX marketplace. As a part of the TCCs, the signatories acknowledged their participation in the manipulative conduct, and committed to ceasing their anticompetitive behavior.

351. Additionally, these banks agreed to assist CADE with its continuing investigation of many other banks for manipulation of FX benchmarks. The banks that remain under investigation by CADE include BofA, Standard Chartered, MUFG, Credit Suisse, Merrill Lynch, Morgan Stanley, RBC, RBS, and UBS. Additionally, there are thirty individuals reportedly under investigation.

352. In July 2017, the Brazilian Federal Public Prosecutor's office indicted five former traders, Eduardo Hargreaves (formerly of Standard Chartered), Sergio Correia Zanini (formerly of RBC), Renato Lustosa Giffoni (formerly of Merrill Lynch), Pablo Frisanco de Oliveira (formerly of Deutsche Bank), and Daniel Yuzo Shimada Kajiya (formerly of Morgan Stanley) on

market (Dec. 9, 2016), <http://en.cade.gov.br/cade-signs-five-agreements-regarding-a-cartel-investigation-in-the-foreign-exchange-market-and-opens-a-new-cartel-investigation-in-the-brazilian-exchange-market>.

suspicion of cartel formation.²³⁴ The complaint alleged that the former traders colluded on spreads for USD/BRL and boycotted non-participating traders.

353. On June 13, 2018, CADE announced that it had signed TCCs with RBC and Morgan Stanley, as well as with an individual named Pablo Frisanco de Oliveira.²³⁵ Under the agreements, Morgan Stanley was fined 30.28 million reais (approximately \$8.2 million) and RBC was fined 12.586 million reais (approximately \$3.4 million). CADE found that there was “strong evidence” that Morgan Stanley and RBC conspired to fix spreads and coordinated with each other regarding the purchase and sale of currencies. CADE also found that Morgan Stanley and RBC “possibly shared sensitive commercial information about the market, as well as details about dealings, contracts, future pricing; customers’ demands; strategies and negotiation goals; confidential positions in operations; and specific orders and the amount of performed operations (in and outflow).”

12. The SACC (South Africa) Settlements

354. On February 15, 2017, the South African Competition Commission (the “SACC”), an investigatory body, referred a competition case to governing South African competition tribunal (the “SACC Tribunal”) after finding that Barclays, BofA, BNP Paribas, Citi, Credit Suisse, JPMorgan, HSBC, Standard Chartered, and other banks had colluded to manipulate FX exchange rates.²³⁶

²³⁴ Toni Sciaretta, *MPF denuncia executivos por suspeita de cartel no câmbio*, *Econômico Valor* (July 24, 2017), <https://www.valor.com.br/financas/5049942/mpf-denuncia-executivos-por-suspeita-de-cartel-no-cambio>.

²³⁵ CADE Press Release *CADE signs three agreements regarding a cartel investigation in the foreign exchange market* (June 15, 2018), <http://en.cade.gov.br/press-releases/cade-signs-three-agreements-regarding-a-cartel-investigation-in-the-foreign-exchange-market>.

²³⁶ Tiisesto Motsoeneng, *South Africa watchdog seeks penalty against banks for FX rigging*, *Reuters* (Feb. 15, 2017), <http://af.reuters.com/article/investingNews/idAFKBN15U1Y4>.

355. The SACC found that those banks had a “general agreement to collude on prices for bids, offers and bid-offer spreads for [] spot trades.”²³⁷ The SACC also found that the banks had effectuated their price manipulation “through agreements to refrain from trading and creating fictitious bids and offers at particular times.”²³⁸ The banks had used the Reuters currency trading platform to carry out their scheme, and coordinated using Bloomberg chats, including one room named “ZAR Domination”,²³⁹ telephone conversations, and in-person meetings. Among other tactics, they agreed to trade or not trade, and they took turns transacting (or withholding) to achieve their collective profit motives.

356. The SACC recommended that the Tribunal issue an order declaring that the banks had violated South Africa’s Competition Act and to order them to pay an administrative penalty equal to 10% of their annual FX turnover.

357. On February 17, 2017, Reuters reported that Barclays and Citi had approached the SACC with information pertaining to currency manipulation, and that they were being cooperative with SACC.²⁴⁰ Three days later, SACC announced that it had reached a settlement with Citi, in which SACC announced that Citi had engaged in the conduct previously reported,

²³⁷ SACC Press Release, *Competition Commission prosecutes banks (currency traders) for collusion* (Feb. 15, 2017), <http://www.compcom.co.za/wpcontent/uploads/2017/01/Competition-Commission-prosecutes-banks-currency-traders-for-collusion-15-Feb-2016.pdf>.

²³⁸ *Id.*

²³⁹ Tiisetso Motsoeneng, *South Africa watchdog seeks penalty against banks for FX rigging*, Reuters (Feb. 15, 2017), <http://af.reuters.com/article/investingNews/idAFKBN15U1Y4>.

²⁴⁰ Tiisetso Motsoeneng, *Barclays, Citi gave South Africa watchdogs info for FX probe-sources*, Reuters (Feb. 17, 2017), <http://www.reuters.com/article/safrica-rand-rigging-idUSL8N1G228C>.

and that Citi would pay a penalty of the equivalent of \$5 million.²⁴¹ The Tribunal confirmed the settlement with Citi on April 26, 2017.²⁴²

358. On January 26, 2018, the SACC provided the SACC Tribunal with additional details and records concerning how the banks colluded to manipulate the rand-dollar currency pair, including Bloomberg chatroom conversations between traders, and referred five additional banks to the SACC Tribunal for colluding to manipulate FX exchange rates, including HSBC Bank (US), Merrill Lynch, and Credit Suisse Securities (US).²⁴³

359. In April 2018, the SACC announced that court proceedings against 18 banks accused of rigging the rand currency are likely to start in 2019.²⁴⁴

13. The WEKO (Swiss) investigation

360. The Swiss Competition Commission (“WEKO”) is an independent Swiss federal authority responsible for “combating harmful cartels, monitoring dominant companies for signs

²⁴¹ SACC Press Release, *Competition Commission reaches settlement with Citibank N.A. for colluding* (Feb. 20, 2017), <http://www.compcom.co.za/wpcontent/uploads/2017/01/Competition-Commission-reaches-settlement-with-Citibank-3.pdf>; Ed Stoddard and James Macharia, *South African watchdog fines Citi \$5 mln to settle currency rigging*, Reuters (Feb. 20, 2017), <http://af.reuters.com/article/investingNews/idAFKBN15Z1J6>.

²⁴² *South Africa: Citibank fined for FOREX rigging*, CPI (Apr. 26, 2017) https://www.competitionpolicyinternational.com/south-africa-citibank-fined-for-forex-rigging/?utm_source=CPI+Lista+Combinada&utm_campaign=6772c53463-EMAIL_CAMPAIGN_2017_04_26&utm_medium=email&utm_term=0_ee26de8909-6772c53463-236730097.

²⁴³ Moyagabo Maake, *Five More Banks Added to Long-Running Forex Cartel Case*, Business Day (Jan. 26, 2018), <https://www.businesslive.co.za/bd/companies/financial-services/2018-01-26-five-more-banks-added-to-long-running-forex-cartel-case/>.

²⁴⁴ Wendell Roelf, *UPDATE 1- South African watchdog says forex-rigging trial likely to begin in 2019*, Reuters (April 25, 2018), <https://www.reuters.com/article/safrica-rand-rigging/update-1-south-african-watchdog-says-forex-rigging-trial-likely-to-begin-in-2019-idUSL8N1S26HK>.

of anti-competitive conduct, enforcing merger control legislation, and preventing the imposition of restraints of competition.”²⁴⁵

361. Around September 2013, WEKO launched one of the first investigations into manipulation of the FX market.²⁴⁶ In March 2014, WEKO provided additional details on its ongoing investigations, stating that it was focusing on a total of eight banks, including Defendants Barclays, Citi, Credit Suisse, JPMorgan, RBS, and UBS. WEKO added that “evidence exists that these banks colluded to manipulate exchange rates in foreign currency trades” and reached “anti-competitive agreements to manipulate price rates in foreign exchange trading.” Upon information and belief, WEKO’s investigation of the Defendants is ongoing.

14. The KFTC (Korea) investigation

362. In March 2016, the South Korean Fair Trade Commission (“KFTC”) announced that it fined Deutsche Bank and HSBC for colluding on FX swaps.²⁴⁷ The next month, the KFTC announced that it was investigating Citi and JPMorgan, Barclays, Standard Chartered, and BNP Paribas for participation in the conspiracy.²⁴⁸ In September 2016, the KFTC announced it was conducting a further probe into conduct by Deutsche Bank, HSBC, and BNP Paribas.²⁴⁹ On

²⁴⁵ WEKO, *Competition Commission*, <https://www.weko.admin.ch/weko/en/home.html>.

²⁴⁶ Caroline Copley and Patrick Graham, *Swiss, UK watchdogs step up scrutiny on forex trades*, Reuters (Mar. 31, 2014), <http://www.reuters.com/article/2014/03/31/us-swiss-forex-investigation-idUSBREA2U0EN20140331>; David Schafer, *Swiss and UK watchdogs step up Forex investigations*, Financial Times (Mar. 31, 2014), <http://www.ft.com/cms/s/0/99be70f4-b8ae-11e3-a189-00144feabdc0.html#axzz3VMMdYe4x>.

²⁴⁷ Joyce Lee, *South Korea fines HSBC and Deutsche \$50,000 for FX swap collusion*, Reuters (March 15, 2016), <http://uk.reuters.com/article/uk-hsbc-deutsche-bank-southkorea-idUKKCN0WH08G>.

²⁴⁸ Kim Jae-won, *Citibank, JPMorgan investigated for alleged FX swap bid rigging*, Korea Times (Apr. 7, 2016), http://www.koreatimes.co.kr/www/news/biz/2016/04/488_202115.html.

²⁴⁹ *Korea probing 6 foreign lenders again over FX swap bid-rigging allegations*, PaRR (Sept. 19, 2016), <https://app.parr-global.com/intelligence/view/prime-2302625>.

May 16, 2017, the KFTC announced that it imposed penalties against BNP Paribas and Deutsche Bank for colluding during currency forwards auctions.²⁵⁰ The banks “pre-arranged the winner and bidding details, exchanged price information, and took higher sales margins.”

15. The FSB Report

363. The Financial Stability Board (“FSB”) is an international body that monitors and makes recommendations about the global financial system. The FSB’s stated mission is to “promote global financial stability by coordinating the development of regulatory, supervisory, and other financial sector policies and conducts outreach.”²⁵¹

364. On February 14, 2014, the FSB announced that it would undertake “a review of FX benchmarks and will analyse market practices in relation to their use and functioning of the FX market as relevant.”²⁵² The investigation was launched in response to “concerns [that] have been raised about the integrity of FX rate benchmarks,” and the “[c]onclusions and recommendations will be transmitted by the FSB to the Brisbane Summit.”

365. The FSB issued their report on September 30, 2014. The Board recommended that the benchmarks be reformed in several ways, particularly the WM/Reuters 4 p.m. London fix, which the reports stated was “identified as pre-eminent by market participants.”²⁵³ The FSB’s recommended reforms can be broadly grouped into the following categories: reforms to the calculation methodology of the WMR benchmark rates; reforms based on recommendations

²⁵⁰ *South Korea fines Deutsche Bank, BNP Paribas \$157,000 over FX forward rigging*, Reuters (May 15, 2017), <https://www.reuters.com/article/us-southkorea-antitrust/south-korea-fines-deutsche-bank-bnp-paribas-157000-over-fx-forwards-rigging-idUSKCN18C06G>.

²⁵¹ FSB, *What We Do*, <http://www.financialstabilityboard.org/what-we-do/>.

²⁵² FSB Press Release, *FSB to review foreign exchange benchmarks* (Feb. 14, 2014), http://www.financialstabilityboard.org/2014/02/pr_140213/.

²⁵³ FSB Final Report on Foreign Exchange Benchmarks (Sept. 30, 2014), <http://www.fsb.org/2015/10/fsb-releases-progress-report-on-fx-benchmark-reforms/>.

from reviews by the International Organization of Securities Commissions Organizations (“IOSCO”) of the WM fixes; reforms to the publication of reference rates by central banks, reforms to market infrastructure in relation to the execution of fix trade; and reforms of the behavior of market participants around the time of the major FX benchmarks (primarily the WMR 4 p.m. London fix).

366. On October 1, 2015, the FSB published a progress report on what reforms had been implemented. Although the overall report noted the “good progress” made on the implementation of the reforms, the FSB called for a wider application of the reforms to *all* benchmarks.²⁵⁴

16. Civil lawsuits

367. Plaintiffs in the ongoing antitrust class action, *In re FX*, have reached settlements with the following fifteen defendant banks: BofA, MUFG, Barclays, BNP Paribas, Citi, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan, Morgan Stanley, RBC, RBS, SG, Standard Chartered, and UBS. Those settlements total over \$2.3 billion. Credit Suisse is the only defendant that has not settled the class action.

368. There are also civil lawsuits ongoing in Canada. In September 2015, a number of lawsuits were filed in Canada alleging that Defendants BofA, MUFG, Barclays, BNP Paribas, Citi, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan, Morgan Stanley, RBS, SG, Standard Chartered, and UBS manipulated FX transactions.²⁵⁵ On November 10, 2016,

²⁵⁴ FSB Press Release, *FSB releases progress report on FX benchmark reforms* (Oct. 1, 2015), <http://www.fsb.org/2015/10/fsb-releases-progress-report-on-fx-benchmark-reforms/>.

²⁵⁵ Evan Weinberger, *Big Banks Hit With First Canadian Forex Class Action*, Law360 (Sept. 11, 2015), <https://www.law360.com/articles/701864/big-banks-hit-with-first-canadian-forex-class-action>; Avi Mizrahi, *Major Banks Face New \$1 Billion FX Manipulation Lawsuit in Canada* (Sept. 13, 2015), <http://www.financemagnates.com/institutional-forex/regulation/major-banks-face-new-1-billion-fx-manipulation-lawsuit-in-canada/>.

UBS, BNP Paribas, and BofA settled the claims against them.²⁵⁶ On April 24, 2017, Goldman Sachs, JPMorgan, and Citi settled the claims against them.²⁵⁷

369. On June 13, 2018, the Court of Appeal for Ontario overturned a lower court's decision and held that Bank of Montreal ("BMO") and Toronto-Dominion Bank ("TD") could be added as defendants to one of these lawsuits, on the grounds that claims against such defendants were not time-barred because plaintiffs first learned of their involvement in the FX price-fixing conspiracy "at the UBS proffer (on May 24, 2016)." Regarding this proffer, the court noted that "UBS advised class counsel that it reviewed approximately 2,000 collusive chats dating as far back as 2008 and that FX traders at TD and BMO were among the persons participating in such chats."²⁵⁸

B. Defendants Terminated, Suspended, or Oversaw the Departure of Key Employees and Banned Their Traders From Multi-Bank Chat Rooms

370. Once the media and government regulators began to release information showing that Defendants had colluded to manipulate the FX market, Defendants began to "clear the decks" of their FX operations. As detailed below, Defendants terminated or suspended *at least 51* FX employees, and saw at least eight other long-time, high-ranking FX personnel leave for

²⁵⁶ Marcho Chown Oved, *Three Banks Settle Canadian Foreign Exchange Class-Action Suit for Almost \$16 million*, The Star (Nov. 10, 2016), <https://www.thestar.com/news/world/2016/11/10/three-banks-settle-canadian-foreign-exchange-class-action-suit-for-almost-16m.html>.

²⁵⁷ Julius Melnitzer, *Goldman Sachs, JP Morgan and Citigroup settle forex class action*, Financial Post (Feb. 24, 2017), <http://business.financialpost.com/legal-post/goldman-sachs-jp-morgan-and-citigroup-settle-forex-class-action>.

²⁵⁸ Geoff Zochodne, *BMO, TD can be added to alleged foreign exchange 'price-fixing conspiracy' lawsuit, Ontario court rules*, Financial Post (June 28, 2018), <https://business.financialpost.com/news/fp-street/bmo-td-can-be-added-to-alleged-foreign-exchange-price-fixing-conspiracy-lawsuit-ontario-court-rules>.

other reasons, like to “pursue other interests.” Defendants also banned the use of multi-bank chat rooms by their FX personnel.

371. **BofA** suspended or terminated at least two employees in the wake of the FX scandal.²⁵⁹ In March 2014, BofA suspended Joseph Landes, its head of spot FX trading in Europe, the Middle East, and Africa. In addition, New York-based FX trader Milko Campusano left the bank in April 2014.

372. **Barclays** suspended or terminated at least ten employees following the FX scandal.²⁶⁰ In November 2013, Barclays suspended Chris Ashton, the global head of voice spot trading, and a member of the “Cartel” chat room. Barclays also suspended Russell Katz, Jerry Urwin, Mark Clark, and trader Jack Murray. In April 2014, Barclays fired four traders, and was ordered by the New York Department of Financial Services to fire four more.²⁶¹

373. **BNP Paribas** suspended or terminated at least one FX employee after the scandal broke.²⁶² In March 2014, BNP Paribas suspended Robert de Groot, its head of FX spot trading, and a member of the Bank of England’s Chief Dealers’ Sub Group.

374. **Citi** has suspended or terminated at least three FX employees.²⁶³ Citi suspended Andrew Amantia, an FX trader in New York, and Anthony John, an FX trader in London. Citi

²⁵⁹ Jamie McGeever, *Bank of America suspends senior FX trader in London*, Reuters (Mar. 6, 2014), <http://www.reuters.com/article/2014/03/06/us-bank-of-america-suspends-idUSBREA251MZ20140306>.

²⁶⁰ Caroline Binham and Daniel Schafer, *Barclays suspends six foreign exchange traders*, Financial Times (Nov. 1, 2013), <http://www.ft.com/intl/cms/s/0/c3675c9a-42f2-11e3-8350-00144feabdc0.html#axzz3WB4A422a>.

²⁶¹ Steve Slater and Kirstin Ridley, *Barclays fined \$2.4 billion for FX manipulation, to fire eight staff*, Reuters (May 21, 2015), <http://uk.reuters.com/article/uk-banks-forex-settlement-barclays-idUKKBN0O51QX20150521>.

²⁶² Katie Martin and David Enrich, *BNP Paribas and Bank of America Suspend Forex Traders*, Wall St. J. (Mar. 6, 2014), <http://www.wsj.com/articles/SB10001424052702304554004579422854231268772>.

also terminated its head of European spot trading, Rohan Ramchandani, who was also a member of the Bank of England's Chief Dealers' Sub Group. Citi also terminated Robert Hoodless,²⁶⁴ Perry Stimpson,²⁶⁵ and Carly McWilliams,²⁶⁶ all former currency traders, around November 2014. In addition, the overall head of Citigroup's FX operations, Anil Prasad, left the bank in March 2014 to "pursue other interests."²⁶⁷ Citi also terminated Baris Oztakpan, an FX trader.

375. **Credit Suisse** substantially scaled back its FX trading operations in May 2014 when six employees in New York and London were released in a "cost-cutting drive."²⁶⁸ Those employees include Daniel Wise, the head of spot trading in London, Mark Astley, a director of FX strategy, Monika Dasani, a London-based FX sales person, and Martin Amann, a New York-based director of FX sales. In addition, in September 2013, Todd Sandoz, the head of global FX trading, stepped down after more than 17 years at Credit Suisse.²⁶⁹

²⁶³ Liam Vaughan and Gavin Finch, *HSBC, Citigroup Said to Suspend Traders on Currency Probe*, Bloomberg (Jan. 17, 2014), <http://www.bloomberg.com/news/articles/2014-01-17/hsbc-says-it-suspended-two-london-foreign-exchange-traders-1->.

²⁶⁴ Patrick Gower, *Third Ex-Citigroup Trader Wins Unfair Dismissal Lawsuit*, Bloomberg (July 4, 2016), <https://www.bloomberg.com/news/articles/2016-07-04/third-ex-citigroup-currency-trader-wins-unfair-dismissal-suit>.

²⁶⁵ Alan Tovey, *Citi trader sacked after Forex rigging probe wins unfair dismissal case*, Telegraph (Nov. 17, 2015), <http://www.telegraph.co.uk/finance/newsbysector/banksandfinance/12002204/Citi-trader-sacked-after-forex-rigging-probe-wins-unfair-dismissal-case.html>.

²⁶⁶ Patrick Gower, *Ex-Citigroup Trader Was Cannon Fodder on Maternity Leave*, Bloomberg (Jan. 28, 2016), <https://www.bloomberg.com/news/articles/2016-01-28/citigroup-fx-trader-fired-on-maternity-leave-was-cannon-fodder>.

²⁶⁷ Ambereen Choudhury, *Citigroup Head of Currencies Prasad to Step Down in March*, Bloomberg (Feb. 5, 2014), <http://www.bloomberg.com/news/articles/2014-02-05/citigroup-head-of-currencies-anil-prasad-to-step-down-in-march>.

²⁶⁸ Jamie McGeever, *Credit Suisse chief FX spot dealer and five others leave bank*, Reuters (May 14, 2014), <https://uk.reuters.com/article/uk-creditsuisse-employment/credit-suisse-chief-fx-spot-dealer-and-five-others-leave-bank-idUKKBN0DU0UO20140514>.

²⁶⁹ Robert Mackenzie Smith, *Credit Suisse Global FX Head Sandoz to Leave*, FX Week (Sept. 10, 2013), <http://www.fxweek.com/fx-week/news/2293855/credit-suisse-global-fx-head-sandoz-to-leave>.

376. **Deutsche Bank** suspended or terminated at least six FX employees.²⁷⁰ Deutsche Bank terminated three FX traders in its New York office: Diego Moraiz, the head of the emerging markets FX trading desk; Christopher Fahy, an FX trading director; and Robert Wallden, an FX trading director. DOJ and FBI agents had previously questioned Mr. Wallden at his New York home about transcripts of an electronic chat where he boasted “about his ability to influence currency markets.”²⁷¹

377. Deutsche Bank also fired Ezequiel Starobinsky, an FX trader based in Buenos Aires, Argentina. And Kai Lew, a director of institutional FX sales, was suspended following an internal investigation.²⁷² In addition, Christina Binaghi, a New York-based managing director and head of Latin American FX trading, left the firm in March 2014.²⁷³ In May 2014, Deutsche Bank terminated Marlene Galvan, a Mexican currency trader.²⁷⁴

378. **Goldman Sachs** oversaw the departure of four FX employees in 2014—three senior executives and a trader: Steven Cho, the New York-based global head of spot and forward FX trading for G10 currencies; Leland Kim, another partner in the FX trading business;

²⁷⁰ Gertrude Chavez-Dreyfuss, *Deutsche Bank fires Argentine trader in wake of FX probe*, Reuters (Feb. 5, 2014), <http://www.reuters.com/article/2014/02/05/us-forex-deutsche-argentina-idUSBREA1423620140205>.

²⁷¹ David Enrich, Katie Martin and Jenny Strasburg, *FBI Tries New Tactic in Currency Probe*, Wall St. J. (Nov. 20, 2013), <http://on.wsj.com/OIgEmq>.

²⁷² Katie Martin, *Deutsche Bank Found Inappropriate Communication Between Staffer, Central Banker*, Wall St. J. (Apr. 9, 2014), <https://www.wsj.com/articles/SB10001424052702303873604579491562249087486>.

²⁷³ Francisco Marcelino, *Deutsche Bank Latin America Trading Head Binaghi Departs*, Bloomberg (March 11, 2014), <https://www.bloomberg.com/news/articles/2014-03-11/deutsche-bank-latin-america-trading-head-binaghi-departs>.

²⁷⁴ Gertrude Chavez-Dreyfuss, *EXCLUSIVE-Deutsche Bank terminates Mexican currency trader –source*, Reuters (May 6, 2014), <http://www.reuters.com/article/forex-investigations-deutsche-bank-idUSL2N0NS22420140506>.

and Mitesh Parikh, the European head of spot FX trading.²⁷⁵ In November 2014, Goldman Sachs terminated Frank Cahill, a sterling trader who had previously worked at both Barclays and HSBC.²⁷⁶

379. **HSBC** suspended or terminated at least three FX employees.²⁷⁷ In January 2014, HSBC suspended Serge Sarramenga, the head of its G-10 spot FX desk, and Edward Pinto, an FX trader based in London. In November 2014, HSBC fired Stuart Scott, who was then their European head of currency trading.²⁷⁸

380. **JPMorgan** suspended or terminated at least two FX employees.²⁷⁹ JPMorgan suspended Richard Usher, its head of G-10 spot trading. Usher was a leader of the “Cartel” chat room and was a member of the Bank of England’s Chief Dealers’ Subgroup. JPMorgan also suspended FX trader Gordon Andrew, after allegedly finding evidence that he disclosed trade information to employees at other banks.

²⁷⁵ Michael J. Moore, *Goldman Sachs Currency Traders Cho, Lim Said to Depart*, Bloomberg (Feb. 5, 2014), <http://www.bloomberg.com/news/articles/2014-02-05/goldman-sachs-currency-traders-cho-lim-said-to-depart>.

²⁷⁶ Chiara Albanese, *Goldman Ousts Currencies Trader Connected to Probe*, Wall St. J. (Nov. 18, 2014), <https://www.wsj.com/articles/goldman-ousts-currencies-trader-connected-to-probe-1416333931>.

²⁷⁷ Liam Vaughan and Gavin Finch, *HSBC, Citigroup Said to Suspend Traders on Currency Probe*, Bloomberg (Jan. 17, 2014), <http://www.bloomberg.com/news/articles/2014-01-17/hsbc-says-it-suspended-two-london-foreign-exchange-traders-1->.

²⁷⁸ Martin Arnold, *HSBC fires head of European Currency Trading*, CNBC (Dec. 10, 2014), <http://www.cnbc.com/2014/12/10/hsbc-fires-head-of-european-currency-trading.html>.

²⁷⁹ Gavin Finch and Suzi Ring, *JPMorgan Currency Trader Said to Be Suspended for Actions at RBS*, Bloomberg (Jan. 14, 2015), <http://www.bloomberg.com/news/articles/2015-01-14/jpmorgan-currency-trader-said-to-be-suspended-for-actions-at-rbs>.

381. **Morgan Stanley** oversaw the departure of at least two high-ranking FX executives.²⁸⁰ In March 2014, Steve Glynn, co-head of FX and emerging markets, left the bank. Glynn had been at Morgan Stanley for 14 years. And in August 2014, Stuart Sopp, the G10 FX head, resigned from his position after five years with Morgan Stanley.

382. **RBS** placed at least six FX employees into a disciplinary process, three of whom have been suspended.²⁸¹ London-based FX traders Julian Munson, Paul Nash, and Ian Drysdale have been suspended. And in December 2014, Mr. Nash was arrested and criminally charged by authorities as part of the U.K. Serious Fraud Office's FX manipulation investigation. RBS suspended another three employees in February of 2015 as a part of the "ongoing FX investigation at the bank."²⁸² Mr. Drysdale sued RBS, alleging that he had been unfairly dismissed, and he was merely a "scapegoat" for the bank's failings.²⁸³

383. **SG** fired at least one trader, Ilan Botbol, for multiple instances of misconduct, including widening the spread on a customer trade and bragging about it to traders at BNPP and Morgan Stanley.²⁸⁴ After boasting that he made \$530,000 on the trade, the BNPP trader agreed

²⁸⁰ Reuters, *Morgan Stanley names Falloon as head of Asia Pac fixed income*, Reuters (Mar. 13, 2014), <http://www.reuters.com/article/2014/03/13/morgan-stanley-falloon-idUSL3N0MA30V20140313>.

²⁸¹ Steve Slater and Jamie McGeever, *Six RBS traders could be punished in forex probe*, Reuters (Dec. 23, 2014), <http://uk.reuters.com/article/2014/12/23/uk-rbs-forex-probe-idUKKBN0K116420141223>.

²⁸² Antonia Molloy, *RBS Suspends two more staff as part of forex investigation*, The Independent (Feb. 25, 2015), <http://www.independent.co.uk/news/business/news/rbs-suspends-two-more-staff-members-as-part-of-forex-investigation-10069698.html>.

²⁸³ Steve Slater, *Fired RBS trader says he was 'scapegoat' for Fx fine*, Reuters (Sept. 30, 2015), <https://www.reuters.com/article/us-rbs-forex-tribunal/fired-rbs-trader-says-he-was-scapegoat-for-fx-fine-idUSKCN0RU1P620150930>.

²⁸⁴ Gaspard Sebag, *SocGen Sued by Ex-Banker It Accused of Cheating on FX Trade*, Bloomberg (March 3, 2017), <https://www.bloomberg.com/news/articles/2017-03-03/socgen-sued-by-ex-banker-it-accused-of-cheating-on-fx-trade>.

that Mr. Botbol was a “crook”—an assessment with which Mr. Botbol agreed. Mr. Botbol later sued SG, alleging that he had been unfairly terminated and that SG encouraged traders to communicate with traders at other banks to learn information about the market. In a public statement, Mr. Botbol’s lawyer said of SG, “How can they say the rules were breached when there were none?”

384. *Standard Chartered* suspended at least one FX employee.²⁸⁵ Matt Gardiner, a senior FX trader at SBC, had previously worked at UBS. He was placed on leave during his first month at SCB during investigation of FX rigging, although he was not placed on leave for his activities at SCB. Gardiner resigned in March 2014.

385. *UBS* suspended or terminated at least seven FX employees.²⁸⁶ UBS suspended Niall O’Riordan, its head of FX trading and a member of the Bank of England’s Chief Dealers’ Subgroup. UBS also suspended at least six other FX traders, including New York-based traders Onur Sert and Michael Velardi.

II. ADDITIONAL EVIDENCE THAT DEFENDANTS COLLUDED TO MANIPULATE FX SPOT PRICES AND BENCHMARK RATES

386. Because many FX benchmarks were based on snapshots of actual FX transactions over brief, predetermined periods of time, they were particularly susceptible to manipulation by Defendants, who were the dominant force in the FX market. By jointly pressing through transactions that went one way for a time, while withholding transactions that went the other way at the same time, Defendants could together greatly distort prices during the exact, short time

²⁸⁵ Jamie McGeever and Tom Pfeiffer, *Standard Chartered FX trader Gardiner resigns* – source, Reuters (March 26, 2014), <http://www.reuters.com/article/forex-stanchart-idUSL5N0MN2ED20140326>.

²⁸⁶ Emily Flitter and Jamie McGeever, *UBS suspends U.S.-based forex trader in manipulation probe*, Reuters (Mar. 28, 2014), <http://www.reuters.com/article/2014/03/28/us-forex-ubs-investigation-idUSBREA2R15T20140328>.

frame when the key, rate-setting measurements of the market were being taken. Indeed, during the criminal trial of Cartel chatroom members Usher, Ramchandani and Ashton, a fellow co-conspirator and Cartel member, Matthew Gardiner, confirmed that “generally speaking” the Cartel members would check the chat “everyday” prior to the WMR and ECB fixes “to see who had fixing flows” in order “to coordinate our trading.”²⁸⁷

387. As detailed above, the results of government investigations and admissions by Defendants’ own former employees confirm that Defendants actively colluded to manipulate FX spot prices, including at and around the WM/Reuters and ECB fixing periods. The court in the FX antitrust class action has found that this is a surplus of “direct evidence akin to the ‘recorded phone call in which two competitors agreed to fix prices at a certain level.’” *In re FX*, Dkt. No. 242. As explained below, economic analyses further confirms Defendants’ manipulation of FX prices in and around the benchmark windows, going as far back as 2003.

A. Chat Transcripts Demonstrate Defendants’ Collusion to Manipulate FX Prices and Benchmark Rates

388. As discussed above, government regulators from across the globe have unanimously found that Defendants colluded to manipulate FX prices and benchmark rates. Among the most damning evidence of Defendants’ misconduct are the records of more than two dozen banks’ traders participating in chat rooms in which they exchanged information about pricing, spreads, the timing of transactions, and fixes. The names of the chats show Defendants’ impunity: “The Cartel,” “The Bandits’ Club,” “The Mafia,” “The Swiss Mafia,” “One Team, One Dream,” “The Sterling Lads,” the “Essex Express,” “The Players,” “The 3 Musketeers,” “Barrier Killers,” “Slillaaaaggggsssss2,” “A Co-Operative,” and “The A-Team.” Each

²⁸⁷ Trial Transcript at 632-33, *U.S. v. Usher, Ramchandani and Ashton*, No. 17-cr-19 (S.D.N.Y.).

Defendant participated in at least one of the chats discussed below manipulating the benchmark rates, bid/ask spreads, “working” their clients’ limit orders, or by triggering their clients’ stop loss orders.

389. The Cartel, the most notorious of the chat rooms, was run by Richard Usher while he was chief currency dealer at JPMorgan and head of spot trading for G10 currencies from 2010 to 2013 and while he was a trader at RBS before then. At least six of Defendants’ traders participated in the Cartel, whose other members included:

- Rohan Ramchandani, Citigroup’s head of spot Trading in London;
- Matt Gardiner, Barclays’ director of spot trading for EUR/USD from 2007 to 2001;
- Chris Ashton, former head of Barclays voice spot trading globally;
- Richard Usher, former FX trader at J.P. Morgan; and
- Niall O’Riordan, UBS’s co-global head of G10 and emerging market spot trading.

Usher, Ramchandani, Gardiner, Ashton, and O’Riordan, as described above, have each been fired from their respective institutions.

390. Defendants participated in at least the following chat rooms:

- Defendant **BoFA** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), Japanese yen (JPY), Australian dollar (AUD), Swiss franc (CHF), and South African rand (ZAR).
- Defendant **Barclays** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), British pound (GBP), Japanese yen (JPY), Swiss franc (CHF), Australian dollar (AUD), Canadian dollar (CAD), Russian ruble (RUB), South African rand (ZAR), and Brazilian real (BRL).
- Defendant **BNP Paribas** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), Japanese yen (JPY), Polish zloty (PLN), Russian ruble (RUB), Mexican peso (MXN), Israeli shekel (ILS), and Thai baht (THB).
- Defendant **MUFG** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), Japanese yen (JPY), and Swiss franc (CHF).

- Defendant **Citi** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), British pound (GBP), Japanese yen (JPY), Swiss franc (CHF), Australian dollar (AUD), New Zealand dollar (NZD) Russian ruble (RUB), and South African rand (ZAR).
- Defendant **Credit Suisse** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), British pound (GBP), Australian dollar (AUD), Swiss franc (CHF), Czech koruna (CZK), Israeli shekel (ILS), Polish zloty (PLN), and South African rand (ZAR).
- Defendant **Deutsche Bank** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), the British pound (GBP), Japanese yen (JPY), Swiss franc (CHF), Australian dollar (AUD), New Zealand dollar (NZD), Canadian dollar (CAD), Russian ruble (RUB), South African rand (ZAR), Chinese yuan (CNY), Czech koruna (CZK), Hong Kong dollar (HKD), Hungarian forint (HUF), Polish zloty (PLN), Singapore dollar (SGD), Turkish lira (TRY), Indonesian rupiah (IDR), Indian rupee (INR), South Korean won (KRW), Malaysian ringgits (MYR), and Taiwan dollar (TWD).
- Defendant **Goldman Sachs** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), British pound (GBP), and Australian dollar (AUD).
- Defendant **HSBC** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), British pound (GBP), Swiss franc (CHF), Russian ruble (RUB), Mexican peso (MXN), and Thai baht (THB).
- Defendant **JPMorgan** participated in chat rooms discussing the U.S. dollar (USD), euros (EUR), British pound (GBP), Australian dollar (AUD), Swiss franc (CHF), and South African rand (ZAR).
- Defendant **Morgan Stanley** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), British pound (GBP), Japanese yen (JPY), Australian dollar (AUD), and New Zealand dollar (NZD).
- Defendant **RBC** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), Australian dollar (AUD), New Zealand dollar (NZD), Canadian dollar (CAD), Swiss franc (CHF), Japanese yen (JPY), Czech koruna (CZK), Israeli shekel (ILS), Polish zloty (PLN), South African rand (ZAR).
- Defendant **RBS** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), British pound (GBP), Japanese yen (JPY), Swiss franc (CHF), Australian dollar (AUD), New Zealand dollar (NZD), South African rand (ZAR), and Brazilian real (BRL).
- Defendant **SG** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), Australian dollar (AUD), Polish zloty (PLN), Brazilian real (BRL), Mexican

peso (MXN), Chinese yuan (CNY), Israeli shekel (ILS) and Thai baht (THB).

- Defendant ***Standard Chartered*** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), Japanese yen (JPY), Australian dollar (AUD), Swiss franc (CHF), Brazilian real (BRL) and South African rand (ZAR).
- Defendant ***UBS*** participated in chat rooms discussing the U.S. dollar (USD), euro (EUR), British pound (GBP), Japanese yen (JPY), Swiss franc (CHF), Australian dollar (AUD), New Zealand dollar (NZD), Canadian dollar (CAD), Swedish krona (SEK), Norwegian krone (NOK), Russian ruble (RUB), South African rand (ZAR), Chinese yuan (CNY), Czech koruna (CZK), Hong Kong dollar (HKD), Hungarian forint (HUF), Polish zloty (PLN), Singapore dollar (SGD), Turkish lira (TRY), Indonesian rupiah (IDR), Indian rupee (INR), South Korean won (KRW), Malaysian ringgits (MYR), and Taiwan dollar (TWD).

391. Many regulators have included with their orders, notices, agreements, and reports, extracts from thousands of electronic chat transcripts obtained from Defendants, which describe specific instances of collusion. Each of those orders, notices, agreements, and reports is incorporated by reference in this Complaint. A sample of illustrative chats are described herein.

392. ***Traders “don their hat” to an RBS trader for successfully manipulating the WM/Reuters Closing Rate.*** In an undated transcript released by the CFTC, RBS had a client order to sell the GBP/USD currency pair at the 4 p.m. WM/Reuters Closing Rate fixing period.²⁸⁸ In that situation, RBS would benefit from driving the WM/Reuters Closing Rate downward. An RBS trader shared this trade information with traders from two other banks in an electronic chat room, and learned that they also had sell orders for that currency pair. The traders then coordinated their positions immediately before the fixing, and discussed the favorable results immediately afterwards:

15:45:35	RBS Trader:	im getting abt 80 quid now...fixing
15:45:54	Bank U Trader:	my ny 100 quid . . .
15:51:19	RBS Trader:	getting more than u now [Bank U Trader] betty

²⁸⁸ Final Notice to RBS at 20 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-rbs.pdf>.

15:51:26	Bank U Trader:	ok thx
15:52:23	Bank W Trader:	nice job gents
15:54:16	Bank U Trader:	[RBS Trader], just matched with [Bank 1] and [Bank 2] for 100, still lhs in about 140
15:54:26	RBS Trader:	cool . . .
16:00:58	Bank Z Trader:	i don my hat . . .
16:01:08	Bank W Trader:	what a job
16:01:23	Bank Z Trader:	welld one lads
16:01:28	Bank W Trader:	bravo
16:07:03	RBS Trader:	1.6218 . . . nice
16:07:33	Bank U Trader:	worked ok that one . . .

393. The other traders continued to laud RBS, making statements like “[RBS] is god,” welld one [sic] lads,” “what a job,” “brave,” and “we fooking killed it right.”

394. The Third Amended Complaint in *In re FX* revealed that this chat came from the “Sterling Lads” chat room, and the Sterling Lads coordinated their trading ahead of the fix with JPMorgan and Credit Suisse outside of the room, although the transcript of those chats has not been made publicly available. Dkt. No. 619 (“TAC”), ¶ 212.

395. *A JPMorgan trader colluded with a trader from another bank to “double team” the WM/Reuters Closing Rate.* In one transcript released by the FCA, a trader at JPMorgan had net buy orders of the EUR/USD currency pair at the WM/Reuters Closing Rate fixing period, which meant that it would benefit if it could move the rate upwards.²⁸⁹ In the 20 minutes preceding the fixing, a JPMorgan trader disclosed its net orders to another trader, and agreed to “join forces” and “double team em” by coordinating with the other trader to move the fix rate upwards. Prior to the fix window, JPMorgan “built” the volume of EUR that it needed to buy in a series of transactions with market participants.

396. Then, during the fixing window, JPMorgan and the collaborating trader entered a series of large buy orders totaling EUR 259 million—which accounted for 41% of the total

²⁸⁹ Final Notice to JPMorgan (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-jpm.pdf>.

volume of EUR/USD bought during the fix window. The strategy was a success, generating a profit of approximately \$33,000.

397. Afterward, the collaborating trader stated “sml rumour we havent lost it” to which the JPMorgan trader responded “we . . . do . . . dollarr.” The collaborating trader’s bravado continued into the next day, stating to yet another trader “we were EPIC at the [WMR] fix yest[erday]” and “i dragged [JPMorgan] in, we covered all the bases b/w us.”

398. *An HSBC trader colluded with traders at three other banks to “team whack” the WM/Reuters Closing Rate.* The FCA released a similar example of benchmark manipulation by HSBC, which held a net sell position in an undated transcript and would benefit from moving the WM/Reuters Closing Rate lower.²⁹⁰ An HSBC trader accomplished this by coordinating with traders at three other firms to “team whack” the WM/Reuters Closing Rate. These traders used a variety of techniques, including “building,” “clearing the decks,” and coordinating large sell orders in and around the fixing window to suppress the closing rate. The result was a profit of approximately \$162,000.

399. The traders congratulated one another by saying “nice work gents . . . I don my hat,” “Hooray nice team work”, “bravo . . . cudnt been better” and “have that my son . . . v nice mate” and “dont mess with our ccy [currency].” One of the traders commented “there you go . . . go early, move it, hold it, push it.” The HSBC trader stated “loved that mate . . . worked lovely” and “we need a few more of those for me to get back on track this month.”

400. *Traders from UBS and three other banks shared their “scores” after manipulating the WM/Reuters Closing Rate.* In a transcript released by the CFTC, traders from

²⁹⁰ Final Notice to HSBC, at 18-20 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-hsbc.pdf>.

UBS and three other banks exchanged customer order information.²⁹¹ Once the traders realized that they were all net sellers, they coordinated their transactions in order to drive the WM/Reuters Closing Rate downward. One trader stated that “we gonna be able to get it to” a lower fix price, to which another trader joked about his use of “the royal fkn we.” Another trader remarked “it cant be a good day to be” a buyer.

401. After the fixing window closed, one of the traders said “nice call,” and each of the chat room members gave their “scores,” or profits from manipulating the WM/Reuters Closing Rate. Those scores ranged from \$60,000, to \$220,000.

402. *Traders from Citi, JPMorgan, and UBS “double teamed” the WM/Reuters Closing Rate in “The Cartel” chat room.* The Defendants added insult to injury by naming the chat rooms to boast of the illegal collusion. For example, the CFTC released the transcript of a chat from members of “The Cartel” chat room, including traders from Citi, JPMorgan, and UBS.²⁹² In the transcript, the Defendants coordinated their trading activities to manipulate the WM/Reuters benchmark rate. The traders in that chat room used the code word “pickun” to discuss the WM/Reuters rate. Minutes before the WM/Reuters rate was set, a JPMorgan trader informed a Citi trader “ok, I got a lot of euros[.]” The Citi trader responded first, “?” and then “u selling?” The JPMorgan trader replied “yes.” As shown below, the traders proceeded to “double team” the WM/Reuters rate by coordinating their sales at the time of the fixing.

15:51:46	JPMorgan	u want it?
15:52:24	Citigroup	ill take it [JP Morgan trader]
15:52:26	Citigroup	if u don’t want it
15:52:39	JPMorgan	tell u what

²⁹¹ Order Instituting Proceedings, *In the Matter of UBS AG*, at 7 (Nov. 11, 2014), <http://www.cftc.gov/idx/groups/public/@lrenforcementactions/documents/legalpleading/enfubso rder111114.pdf>.

²⁹² CFTC Examples of Misconduct, HSBC (Nov. 14, 2014), <http://www.cftc.gov/idx/groups/public/@newsroom/documents/file/hsbcmisconduct111114.pdf>.

15:52:42	JPMorgan	lets double team it
15:52:45	JPMorgan	how much u got
15:52:46	Citigroup	ok
15:52:47	Citigroup	300
15:52:52	Citigroup	U?
15:53:01	JPMorgan	ok ill give u 500 mor
15:53:05	Citigroup	wow
15:53:06	Citigroup	Ok
15:53:08	Citigroup	ha
15:53:09	Citigroup	cool
15:53:14	UBS	<i>REDACTED</i>
15:53:20	JPMorgan	so we have 800 each
15:53:21	JPMorgan	ok
15:53:31	JPMorgan	but we gotta both do some at fix
15:53:36	JPMorgan	don't sell em all and take the foot off
15:53:40	Citigroup	I promise I will
15:53:47	JPMorgan	me too

403. *A trader from UBS “made the year” for traders from Barclays and other banks, by successfully manipulating the ECB rate.* Notably, the chat room transcripts reveal that Defendants attempted to manipulate other benchmark rates aside from the WM/Reuters Closing Rate. For example, chats released by the FCA and the DFS show that on February 15, 2012, traders from UBS, Barclays and two other banks used “The Cartel” chatroom to coordinate their trading ahead of the ECB’s fixing window.²⁹³

404. Prior to the ECB fixing window (around 1:15 p.m. London time), the traders for the various banks disclosed that they had net sell orders of millions of dollars in euros. A trader for one of the other banks suggested that the firms “hold” onto their sell orders “for twelve minutes,” i.e. until the ECB rate fixing window opened.

405. The banks also disclosed that they had millions of euros in shorts and other purchase orders. One of the traders from the other banks in the chat room advised those firms to

²⁹³ Consent Order, *In the Matter of Barclays Bank PLC, et al.*, at 10-11 (May 15, 2015), <http://www.dfs.ny.gov/about/ea/ea150520.pdf>; Final Notice to UBS, at 18-21 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-ubs.pdf>.

sell later, when the price would be lower. The trader from UBS sold €100 million at three basis points below the market trading price for euros; this transaction accounted for 27 percent of the sales of euros during the ECB fixing window. The ECB later published the ECB rate at a price that was equal to the price submitted by the UBS trade. The Defendants directly profited from this lower price in later deals that day. For UBS, the lower in price generated \$513,000 in profits.

406. In the chat room, the other banks congratulated the UBS trader for “mak[ing] most peoples year.”

407. *Traders from Barclays, Citi, RBS, and two other banks congratulated each other after “mangling” the ECB fix.* The FCA released a similar transcript showing traders from Barclays, Citi, and two other banks conspiring to manipulated the ECB fix for the EUR/USD currency pair on February 21, 2012.²⁹⁴ The traders shared information about their pending customer orders: Barclays and another bank had net sell orders, while Citi and a fourth bank had net buy orders. The Barclays trader then informed the Citi trader that it had “netted off” its sell orders with RBS, so the Citi trader “shud be nice and clear to mangle.” A trader from the other bank with net sell orders also “shift[ed]” its orders to a third party, and told the Citi trader “you’re all clear.” Meanwhile, the trader from the bank with net buy orders transferred those orders to the Citi trader, to “assist it” in driving prices upward.

408. After the ECB fix was set, these traders congratulated each other by writing, “impressive,” “lovely,” and “cnt [sic] teach that.” The trader from Citi commented on the

²⁹⁴ Final Notice to Citibank, at 17-20 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-citi-bank.pdf>; Consent Order, at 11, *In the Matter of Barclays Bank PLC, et al.* (May 15, 2015), <http://www.dfs.ny.gov/about/ea/ea150520.pdf>.

collusion, “yeah worked ok.” Once the specific rate was published, the Barclays traders wrote “22 the rate” to which the Citi trader commented “always was gonna be.”

409. *A trader from Barclays colluded with traders from other banks to “lower the fix” for CME/EMTA rates.* The Defendants also used chat rooms to collude to fix CME/EMTA rates. For instance, a Barclays traders discussed fixing the CME/EMTA rates for RUB/USD currency pair in a chat room with other banks.²⁹⁵ One trader suggested “we should all lower fix by several kopecks.” Another bank replied “yes,” and a third agreed that “it is a right idea to lower the fix by a few kopecks.” The Barclays trader responded “so what, 5 kopecks and all/everyone is splendid.” Accordingly, the Barclays trader then submitted an artificially low indicative bid and offer that the CME used to calculate the final CME/EMTA rate.

410. *Traders from Barclays, HSBC, and several other banks simultaneously used multiple chat rooms to “team whack” the WM/Reuters rate.* The chats released by regulators show that Defendants’ conspiracy was widespread and involved multiple layers; often Defendants used multiple chat rooms and held discussions with many different banks in one single afternoon of manipulation. For example, the CFTC revealed a chat from June 28, 2011, in which traders from HSBC and Barclays announced that they were net sellers of GBP/USD and that they would “team whack” the WM/Reuters Closing Rate in the “cable” (a common term for the GBP/USD currency pair).²⁹⁶

²⁹⁵ CFTC Examples of Misconduct, Barclays (May 20, 2015), <http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/fxbarclaysmisconduct052015.pdf>.

²⁹⁶ CFTC Examples of Misconduct, HSBC (Nov. 14, 2014), <http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/hsbcmisconduct111114.pdf>); *see also* Final Notice to HSBC (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-hsbc.pdf>; Consent Order, at 10-11, *In the Matter of Barclays Bank PLC, et al.* (May 15, 2015), <http://www.dfs.ny.gov/about/ea/ea150520.pdf>.

411. At the same time, the trader from HSBC and a different trader from Barclays were using a separate chat room to further coordinate their trading activities to manipulate the WM/Reuters Closing Rate. An HSBC trader told a Barclays trader “get lumpy cable at the fix ok,” and “lets go,” to which the Barclays traders replied “yeah baby.”

412. Concurrently with the two chats discussed above, the same trader from HSBC used yet another chat room to gather information from a trader at a different bank. The HSBC trader asked “can you do some digging and see if anyone is that way,” to which the other trader replied “of course mate.”

413. After the WM/Reuters Closing Rate was set, the traders in all three of these chat rooms exchanged congratulations for their coordinated manipulation of the benchmark, saying “well done gents,” “hooray nice team work,” “nice one mate,” “bravo,” “have that my son,” and “that worked nice mate.”

414. *Traders from Barclays “clear the decks” to allow HSBC the “bang the close” prior to the setting of the WM/Reuters rate.* Many of the chats illustrate how Defendants “cleared the decks” of their own customer orders in order to allow traders at other banks to successfully “bang the close” by executing price-moving transactions during the benchmark fixing period.

415. For example, the CFTC released a transcript showing a trader from Barclays clearing the decks for a trader from HSBC by getting rid of the main buyer.²⁹⁷ Shortly before the WM/Reuters fix was set, the Barclays trader wrote “right ive taken him out” and “he paid me for 186[.]” HSBC replied “ok thx[.]” Barclays wrote back, “so shud have giot rid of main buyer for u” and “im stilla seller of 90[.]” “give us a chance and ive paid a load of bro ha[.]”

²⁹⁷ *Id.*

416. In a simultaneous chat, traders from Barclays and HSBC discussed unloading their currency sales just before the WM/Reuters fixing window—a classic example of “banging the close.”²⁹⁸ The Barclays trader wrote, “can u let me know when are down to your last tenner” and a trader from HSBC replied “okay” and then (eight seconds later) “i’m down to my last tenner[.]” Barclays wrote back, “ok ta” and “just sold some more[.]” HSBC replied “hahaha” and Barclays responded “hehehe[.]”

417. After the WM/Reuters fix was set, the traders congratulated each other. Barclays wrote “nice on son” and HSBC replied “learnt from a good fella[.]” Barclays then said “there u go[.]” and advised, “go early, move it, hold it, push it[.]” The traders also lamented that they did not manipulate the benchmark rate even more drastically. Barclays wrote, “yeah babyxx” and “[HSBC Trader] [Barclays Trader] combo boom[.]” HSBC replied, “loved that mate” and “worked lovely” and finished that it was a “pity we couldn’t get it below the 00[.]”

418. ***Barclays’ former global head of FX spot trading colluded with traders at other banks to “rip” customer stop-loss orders.*** Many of the chats show that Defendants often manipulated FX prices and benchmark rates in order to inappropriately trigger customer stop-loss orders, which would generate substantial profits for Defendants. For example, in a chat released by the Federal Reserve, Barclays trader Christopher Ashton, who later became Barclays’ Global Head of FX Spot business, coordinated with traders at other banks to manipulate the FX market and inappropriately trigger stop-loss orders.²⁹⁹ Ashton and traders from two other banks discussed Ashton’s clients’ stop-loss orders. After disclosing the order and

²⁹⁸ CFTC Examples of Misconduct, HSBC (Nov. 14, 2014), <http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/hsbcmisconduct111114.pdf>.

²⁹⁹ Notice of Intent to Prohibit, at 13-14, *In the Matter of Christopher Ashton*, Dkt. No. 16-015 (June 30, 2016), <https://www.federalreserve.gov/newsevents/press/enforcement/enf20160829a1.pdf>.

receiving encouragement to “rip it” (or trigger the order), Ashton triggered a stop-loss order that helped the competing trader in the marketplace. Ashton then wrote, “happy to oblige,” to which the other trader replied, “thx” and “i enjoyed that.” In other words, Ashton used the chat room to assist a competitor trigger their own stop-loss orders.

419. The chat transcripts released by the FCA contain many additional instances of Defendants manipulating FX spot prices in order to trigger their clients’ stop-loss orders. For example, a Citi trader wrote that he “had to launch into the 50 offer to get me stop done” and discussed how he “went for a stop.”³⁰⁰

420. Similarly, a JPMorgan trader wrote that he had traded in the market “to get the 69 print,” which meant he traded to move the market to a level that would trigger a stop-loss transaction. The same JPMorgan same trader disclosed the level of customer stop-loss orders to other traders and wrote “shall we go get these stop?”³⁰¹ In that same vein, an HSBC trader said that he was “going to go for broke at this stop . . . i t is either going to end in massive glory or tears.” He wrote on another occasion, “just about to slam some stops.” A different HSBC trader replied to the questions of whether stop-loss order were “a pain for you guys” that “nah love them . . . free money” and “we love the orders . . . always make money on them.”³⁰²

421. An RBS trader asked another trader in a chat room if he would trigger one of his clients stop-loss orders, writing “HIT IT . . . I’m out of bullets haha.” Finally, a UBS trader

³⁰⁰ Final Notice to Citibank, at 20-21 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-citi-bank.pdf>.

³⁰¹ Final Notice to JPMorgan, at 20 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-jpm.pdf>.

³⁰² Final Notice to HSBC, at 20-21 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-hsbc.pdf>.

commented to another chat room “i had stops for years but they got sick of my butchering” and subsequently described himself as “just jamming a little stop here.”³⁰³

422. *An RBS trader used “ammo” received from another bank to manipulate the WM/Reuters Rate for AUD and NZD.* The chat transcripts reveal manipulation across many different currency pairs. For instance, in a chat released by the CFTC, a trader from RBS conspired with traders from two other banks to manipulate the WM/Reuters rate for the AUD/USD and NZD/USD currency pairs.³⁰⁴

15:43:42	Bank x	buying aud and nzd at the fix
15:43:43	RBS	Tkx
15:43:52	Bank x	ntg big
15:43:59	RBS	Im buying 50 aud can do yours if you want
15:45:13	Bank x	ok . . . 60 plse . . . *****
15:45:56	RBS	Great
15:50:00	Bank y	I need to buy 25 aud at the fix too.. any int?
15:50:21	RBS	Sure
15:51:24	Bank y	cool all yours
15:51:46	RBS	Buying 220 now
15:51:57	Bank y	good luck
15:52:20	Bank x	load up your 50 offrs . . .
15:53:14	Bank y	ill do those if you want
15:53:19	RBS	haah
15:53:20	Bank x	ur fkg, ramp it
16:00:41	Bank x	nice one *****
16:00:56	Bank y	look at you!....-well done mate . . .

423. *A trader actively participated in the chats, both while he was employed by Barclays, and after he joined another bank.* The participants in the chat rooms were often employed by multiple Defendants at different points in their career. This further facilitated the collusion, as many of the participants were former colleagues. For example, the DFS released

³⁰³ Final Notice to UBS, at 21-22 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-ubs.pdf>.

³⁰⁴ Order Instituting Proceedings, at 6-7, *In the Matter of The Royal Bank of Scotland PLC*, CFTC Dkt. No. 15-05 (Nov. 11, 2014), <http://www.cftc.gov/idx/groups/public/@lrenforcementactions/documents/legalpleading/enfroyalbankorder111114.pdf>.

several transcripts from late 2010 to early 2011 in which a Barclays trader colluded with traders at JPMorgan, Standard Chartered, and other banks, to manipulate FX prices and benchmark rates.³⁰⁵ In June 2011, the trader left Barclays and later joined a different bank, where he continued to engage in similar conduct, including with his former colleagues at Barclays. For instance, the former Barclays trader told another trader then-employed by Barclays to coordinate their trades “so we don’t get in each others way.”

424. *Traders from Citibank, JPMorgan, and UBS collude to protect the secrecy of the chat rooms.* The transcripts reveal that the Defendants jealously guarded the membership of the chat rooms and continually discussed protecting the secrecy of the chat rooms. In an undated chat transcripts revealed by the CFTC, traders from Citi, JPMorgan, and UBS discussed the potential of adding a unnamed fourth trader to chat room. The main concerns in these conversations was protecting the secrecy of the chat room.³⁰⁶

7:49:55	Bank Z	are we ok with keeping this as is
7:50:27		ie the info lvl & risk sharing?
7:50:27	Citi trader	well...
7:50:30	Bank Z	that is the qu[estion]
7:50:32	Citi trader	you know him best obv...
7:50:39		if you think we need to adjust it
7:50:43		then he shouldn't be[] in chat
7:50:54	Bank Y	yeah that is key
7:51:00		simple question [Bank Z trader]
7:51:08		I trust you implicitly [Bank Z trader]
7:51:13		and your judgement
7:51:16		you know him
7:51:21		will he tell rest of desk stuff
7:51:26		or god forbin his nyk...
7:51:46	Citi trader	yes
7:51:51		that's really imp[ortant] q[uestion]
7:52:01		dont want other numpty's in mkt to know

³⁰⁵ Consent Order, at 11-12, *In the Matter of Barclays Bank PLC, et al.* (May 15, 2015), <http://www.dfs.ny.gov/about/ea/ea150520.pdf>.

³⁰⁶ CFTC Examples of Misconduct, HSBC (Nov. 14, 2014), <http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/hsbcmisconduct111114.pdf>.

7:52:17 but not only that
 7:52:21 is he gonna protect us
 7:52:33 like we protect each other against our own
 branches

425. This discussion ended when the traders concluded that the fourth trader would “add huge value to this cartel” and hence should be given a “1 month trial.”³⁰⁷ However, when the fourth trader was invited to join, he was simultaneously warned “mess this up and sleep with one eye open at night.” This same trader from Citi would later refer to the other traders in this chat room as “1 team.”³⁰⁸

426. *An HSBC trader chastised another chat room participant as “useless” for not disclosing a large customer order.* There was enormous pressure on participants in the chats to continually share their confidential customer information and actively participate in the manipulation of FX prices. Those who did not were subject to harsh criticism and ridicule by their peers. For example, in transcript released by the FCA, an HSBC trader criticized another trader in the group for not disclosing a large net sell order in advance of the WM/Reuters Fixing.³⁰⁹ The HSBC trader remarked, for the entire chat group to see, “u are useless . . . how can I make free money with no fcking heads up.”

427. *BNPP receives “extra ammo.”* The DFS found that, in October 2012, a trader at an unidentified bank offered to let a London-based BNP Paribas trader “build ammo.” The other bank trader asked the BNPP trader “u want a Christmas present,” and offered a fix order to the

³⁰⁷ Order Instituting Proceedings, In the Matter of JPMorgan Chase Bank, N.A., CFTC Dkt. No. 15-04 (Nov. 11, 2014), <http://www.cftc.gov/idx/groups/public/@lrenforcementactions/documents/legalpleading/enfjpmorganorder111114.pdf>.

³⁰⁸ Final Notice to Citibank, at 16 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-citi-bank.pdf>.

³⁰⁹ Final Notice to HSBC, at 15 (Nov. 11, 2014), <https://www.fca.org.uk/publication/final-notices/final-notice-hsbc.pdf>.

BNPP trader, who incredulously replied “u don’t wanna wollop it;” i.e., he assumed that the other trader would “wollop” the trade himself. When the other trader allowed the BNPP trader to do the honors, the BNPP trader executed the order during and around the fixing window. After the fix rate was announced, the BNPP thanked his co-conspirator: “schweeeeet! Thks bra extra helped . . . extra ammo helped loads.”³¹⁰ On another occasion, a BNPP trader based in London asked a trader at another bank about the upcoming ECB fix, saying “any huge interest ecb?” After the BNPP informed the other trader of the direction of the BNP Paribas orders and which way he would be trading, the other bank trader replied “I am the same way . . . u want some ammo . . . see what u made of[?]” The BNP Paribas trader said he “agreed,” and the other bank trader responded, “good luck amigo.”³¹¹

428. *Cartel Members put “stupid bids in.”* On another occasion, two traders—one from BNP Paribas and both members of “The Cartel”—colluded to manipulate the fix to profit against each other’s client orders. While reveling, the BNP Paribas trader said “how easy was that to bully,” and the other trader responded “mate it worked lovely, in these markets when we have the ball, we need to make it count, as you were scaring the voice market, I was putting stupid bids in.”³¹²

429. *BNPP Trader Asks His Co-Conspirators to “pls . . . make the fix higher.”* A Russia-based BNP Paribas trader participated in a chat room with traders from other banks, all of whom were submitters to the CME/EMTA fix for their respective banks. The DFS revealed that on at least nine occasions, the BNP Paribas trader and the other members of this chat room

³¹⁰ Consent Order, at ¶ 52, *In the Matter of BNP Paribas S.A., et al.* (May 24, 2017), <https://www.dfs.ny.gov/about/ea/ea170524.pdf>.

³¹¹ *Id.* at ¶ 53.

³¹² *Id.* at ¶ 54.

inquired about each other's submissions ahead of time or tried to agree about what levels to submit. This collusion violated the rules of the benchmark submission process. On one occasion, the BNP Paribas trader asked his counterparts to help skew their submissions, saying "Guys, will you please put emt [bids] a bit higher please ... if it makes no difference;" or "Guys, could pls you make the fix higher, if you don't give a shit what bid [you'd otherwise make]?"³¹³

430. *NYDFS Details Credit Suisse's Efforts to Build "Ammo."* Traders at Credit Suisse frequently built ammo with traders at other banks to influence the fixes. For example, in March 2011, Jason Katz stated to a Credit Suisse trader that Katz was "going to try and drive it up on the fix and than [sic] keep some to be short." A trader at Credit Suisse then asked in Katz "need[ed] more ammo to drive it up," to which Katz replied he would "watch" the Credit Suisse trade. Signaling his approval, the Credit Suisse trader said "no problomo." Similarly, in May 2012, a different Credit Suisse trader discussed how to affect the price in EUR/JPY with a trader at another bank. The other trader indicated he wanted to drive the price of the pair down to 98.74, to which the Credit Suisse offered his assistance by placing orders below that price: "go for it I'll stick in a few bids sub 74." After the price had sunk low enough, the Credit Suisse trader said "ok pulling my bids," an admission that she had no intention of executing trades at that level—the bids were pure price manipulation. The other trader asked the Credit Suisse trader not to withdraw her bids, making the cavalier observation that it "smlls unethical haha" and "if custy ever found out we both dead." Another trader in the chat, well aware of the illicit nature of this exchange, said "what the hell are u two planning . . . this chat is a compliance dream."

³¹³ *Id.* at ¶¶ 75-76.

431. Plaintiffs in *In re FX* have also obtained from Defendants many chat transcripts further demonstrating that Defendants colluded to manipulate the fixes. Many of those chat transcripts are described in the Third Consolidated Amended Class Action Complaint (“TAC”). *In re FX*, Dkt. No. 619. Many of the chats included in the TAC are in redacted form, because they are subject to the protective order and the class action is subject to a discovery freeze at the request of the DOJ. Time after time, the chats obtained by the FX class plaintiffs show that the Defendants did exactly that. *See* TAC ¶¶ 163, 197-242. For example:

- In an unidentified chat, traders from JPMorgan, BofA, HSBC, UBS, Standard Chartered, and Citi discussed the WM/R fix from 13:16:45 to 13:23:04 UTC on a date that is not publicly available.
- In an unidentified chat, traders from JPMorgan and SG coordinated trading right before the WM/Reuters Closing Spot Rate for AUD/BRL (Australian Dollar/Brazilian Real) and succeeded in manipulating that rate from 10:58:17 to 11:03:55 EST on June 30, 2010.
- In an unidentified chat, traders from Goldman Sachs, JPMorgan, and Credit Suisse “took actions to continue the conspiracy through alternate means” from 10:52:50 to 10:59:10 EST on December 4, 2012.
- In an unidentified chat, traders from BNP Paribas and JPMorgan exchanged position information going into the ECB Fix from 7:55:37 to 8:12:26 in an unspecified time zone on September 2, 2011.
- In an unidentified chat, traders from Barclays, MUFG, and UBS coordinated trading going into the ECB fix from 11:56:25 to 12:15:34 UTC on a date that is not publicly available.

432. In addition to the admissions by Barclays, Citi, and JPMorgan that they triggered client stop-loss orders and those banks’ plus RBS’s admissions that they worked their clients’ limit orders in their DOJ guilty pleas, the class complaint reveals that Deutsche Bank, UBS, BofA, Standard Chartered, and BNP Paribas colluded to trigger client stop loss orders in a Bloomberg chat from 8:21:04 to 8:25:36 UTC and again from 18:45:46 to 18:48:56 UTC on a date that is not publicly available.

B. Economic Analyses Further Demonstrate Defendants' Manipulation of FX Prices and Benchmark Rates

433. Defendants' manipulation of the FX benchmark rates is further demonstrated by economic analyses of the benchmarks and prices around the fixing windows.

434. As confirmed by Congressional testimony and academic publications, "screens" are statistical tools based on economic models that use data such as prices, bids, quotes, spreads, market shares, and volumes to identify the existence, causes, and scope of manipulation, collusion, or other illegal behavior. For instance, "screens" were part of an analysis that eventually led to the discovery of the LIBOR rate-setting scandal that is still roiling the banking industry. In the context of LIBOR, journalists and economists uncovered anomalous behavior in the benchmark as compared to movements in other publically available data points (data points that were independent of the banks' purported individualized judgment).³¹⁴

1. Economic reporting by Bloomberg led to the initial detection of FX manipulation

435. In August 2013, *Bloomberg News* reported that economic analyses of FX spot prices showed highly predictable recurring spikes in the value of particular currencies against their paired counterparts at the 4 p.m. WM/Reuters fix.³¹⁵ This suspicious price behavior was detected by using a methodology which counted "how many times spikes of at least 0.2 percent occurred in the 30 minutes before 4 p.m. for 14 currency pairs on the last working day of each month from July 2011 through June 2013." *Bloomberg* only counted the spike if it was one of

³¹⁴ See generally Testimony of Rosa M. Abrantes-Metz on behalf of the Office of Enforcement Staff, Federal Energy Regulatory Commission (Sept. 22, 2014), http://elibrary.ferc.gov/idmws/doc_info.asp?document_id=14274590.

³¹⁵ Liam Vaughan and Gavin Finch, *Currency Spikes at 4 P.M. in London Provide Rigging Clues*, *Bloomberg* (Aug. 27, 2013), <http://www.bloomberg.com/news/2013-08-27/currency-spikes-at-4-p-m-in-london-provide-rigging-clues.html>.

the three largest of the day, and it reversed itself within thirty minutes—signs that the change was consistent with deliberate and targeted manipulation of the currency pair.

436. Across 14 currency pairs, *Bloomberg* found a qualifying spike nearly a third of the time. For certain major currency pairs, such as those involving U.S. Dollars or British Pounds, the spike occurred on nearly half of the days studied. Once regulators gained access to the Defendants' trading data, they were able to confirm *Bloomberg's* hypothesis. As discussed above, government investigations revealed thousands of examples of Defendants' colluding to manipulate prices in the FX market at and around the time that the WM/Reuters Closing Rate and other FX benchmark were set.

2. Plaintiffs' economic analyses further demonstrate that Defendants manipulated the WM/Reuters Closing Rate from 2003 to 2013

437. Plaintiffs own economic analyses corroborate the public evidence of Defendants' manipulation of FX benchmark rates. In addition, Plaintiffs' analyses go beyond the years that governmental investigators focused on (2008 to 2013), and show that the same anomalous price patterns also occurred, to the same degree, in the preceding years of 2003 to 2007. In other words, the data shows that the conspiracy was alive and well in these earlier years as well.

438. *There was a high frequency of anomalous price movements around the WM/Reuters Closing Rate fixing window for every year from 2003 to 2013.* In conducting their studies, Plaintiffs used conservative assumptions and a series of statistical models and screens to detect anomalous price movements around the setting of the WM/Reuters Closing Rate, while stripping out price movements that might otherwise be attributed to non-manipulative market behavior. Plaintiffs considered the price movements for 28 of the most frequently traded currency pairs, from 2003 to 2013, around the setting of the WM/Reuters Closing Rate. Plaintiffs tracked the price movements and level of volatility for each of those 28 currency pairs,

over the eleven year period. That data was input to a dynamic volatility model, which uses the price patterns seen over time to predict the upper and lower bounds of where prices were expected to fall at any given moment, to a 95% degree of certainty. The dynamic volatility model accounts for variations in volatility and price: the upper and lower bounds for the estimated next price will be wider during periods of high volatility, and narrower during periods of low volatility.

439. Plaintiffs then applied this dynamic volatility model to the 30 minute period leading up to the WM/Reuters Closing Rate fixing. On days when price movements during that 30 minute period were outside the upper and lower bounds estimated by the dynamic volatility model, to a 95% degree of certainty, the day was identified as a manipulation day.

440. To over-simplify, Plaintiffs' analysis sought to isolate instances where prices were moving abnormally, to a statistically significant degree, around the time the WM/Reuters Closing Rate was set. And these abnormal spikes in pricing behaviors were not identified through an arbitrary drawing of a line as to size or duration, but through a dynamic model that was able to identify spikes that stood out even as against the other volatility seen *on that exact same day*.³¹⁶ Only when a spike around the setting window fell outside the extreme bounds of what was expected to happen on a day even after taking into account volatility occurring throughout the rest of that day, did Plaintiffs' model "count" that as an observed manipulation day.³¹⁷

³¹⁶ The model also takes into account the volatility seen on prior days, which is also useful for estimating future volatility levels. However, the most recent data is the most useful, and is thus given the most weight by the model.

³¹⁷ To be clear, these are only days that could be identified through publically available pricing data alone. It is likely Defendants' conspiracy was active with even greater consistency, just that its effects may not stand out *enough* from the noise in the data to be seen through Plaintiffs' preliminary, highly conservative model.

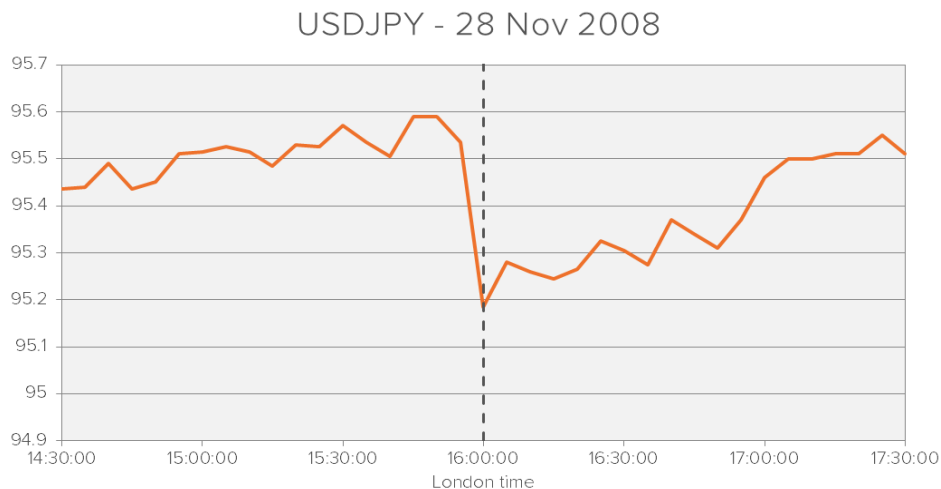
441. The graph below shows the frequency of identified manipulation days, as a percentage of the total days that the WM/Reuters Closing Rate was set, for every year from 2003 to 2013.



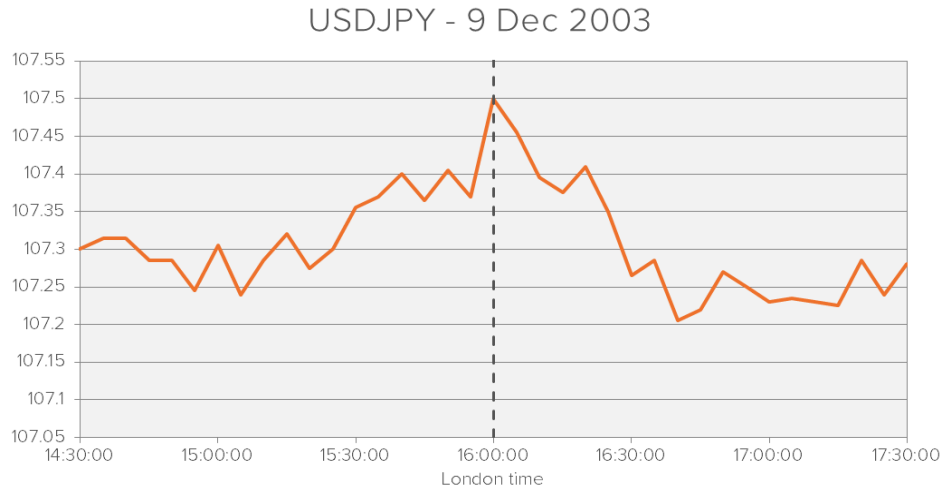
442. As would be expected from a period during which many Defendants have already admitted to manipulating the WM/Reuters Closing Rate, and during which government regulators and the press have also identified a high rate of manipulation, there was a high frequency of manipulation days identified by Plaintiffs' model from 2008 to 2013. During each of those years, the WM/Reuters Closing Rate was identified as being manipulated ***well over 35%*** of the time. This high rate of manipulation was not, however, limited to those years. The preceding years of 2003 to 2007 have a similarly high frequency of identified manipulation

days—again, **over 35%** for each of those years as well. In fact, during 2007, the frequency of manipulation days was **over 40%**. Thus, the data further confirms that FX benchmarks were subject to frequent manipulation, and demonstrates that the manipulation extended throughout the 2003 to 2013 period.

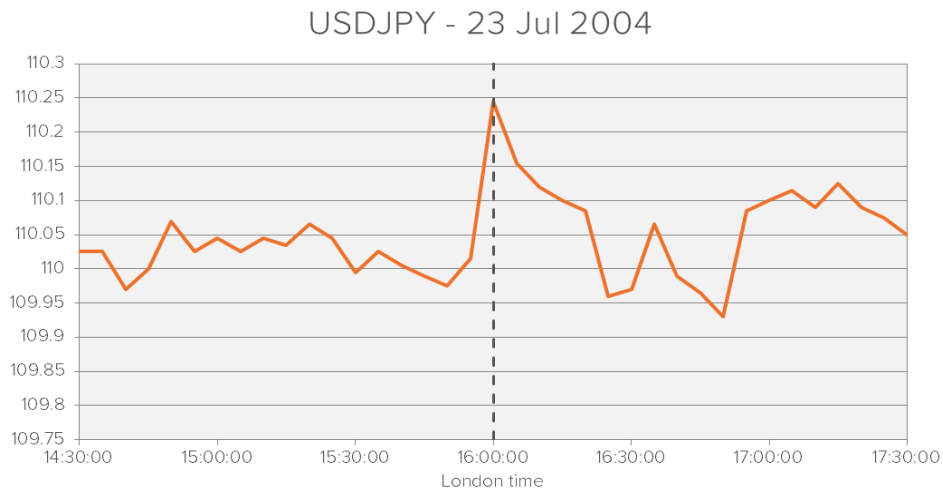
443. *Examples of specific manipulation days.* To see what a specific manipulation day looks like, Plaintiffs also zoomed in on specific days during 2003 to 2013. For example, the following chart depicts the sudden drop in spot prices for USD/JPY on November 28, 2008, right at the time when the WM/Reuters Closing Rate was being measured.



444. The chart below depicts a spike in USD/JPY spot prices during the WM/Reuters Closing Rate fixing window—this time, upward—on December 9, 2003.



445. There was a similarly sharp upward spike in USD/JPY spot prices during the WM/Reuters Closing Rate fixing window on July 23, 2004.

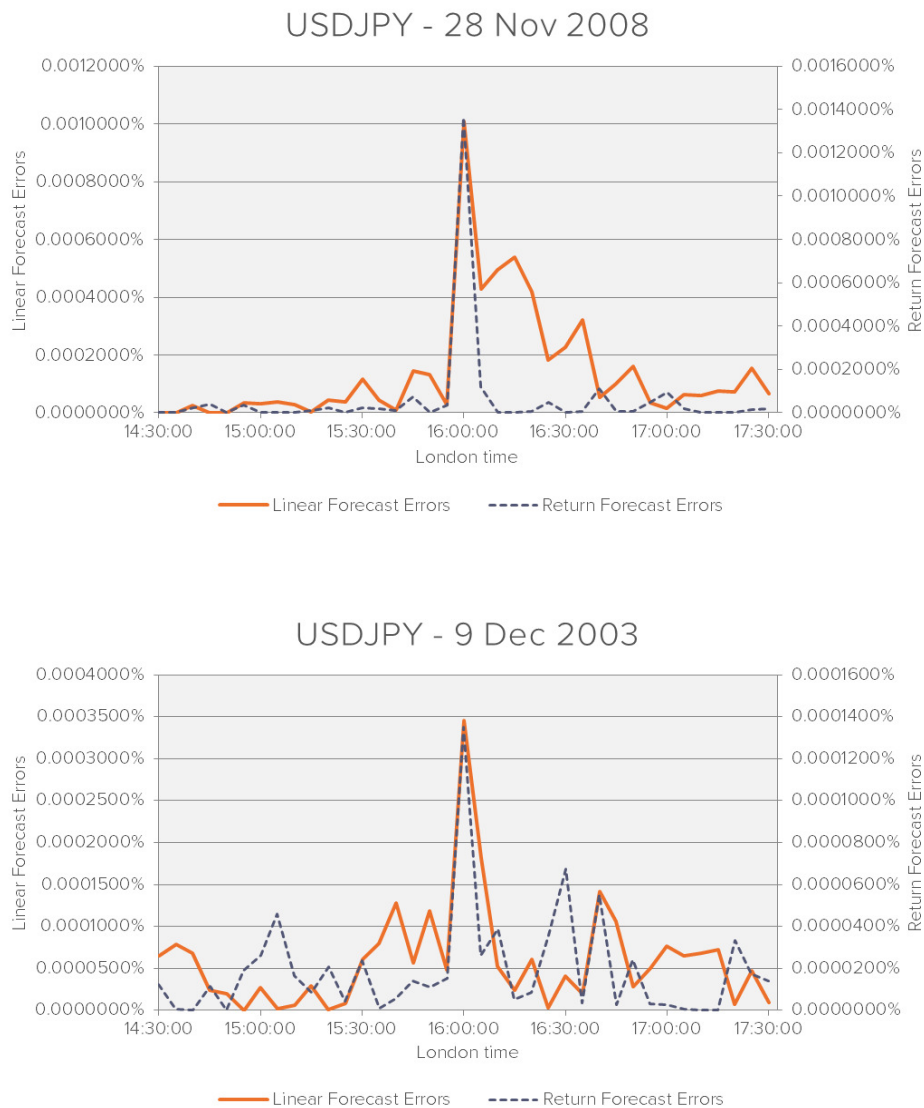


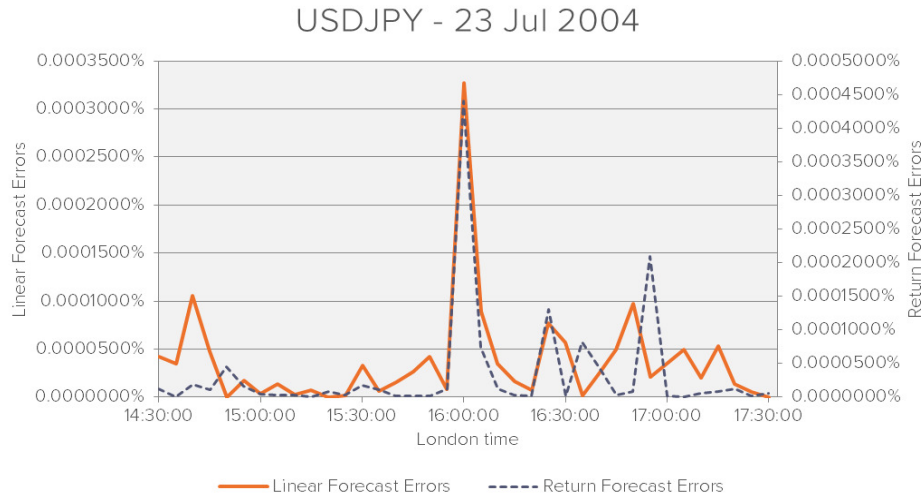
446. The high degree of abnormality in the spikes being used in this analysis to help detect artificiality can also be seen by depicting the data in terms of a “linear forecast error.” This essentially compares the prices in any one minute to the average price of the prior thirty minutes.³¹⁸ During periods of relative stability, this number is around zero, but it goes up when prices are changing, in either direction. A similar concept is to calculate the “return forecast

³¹⁸ Technically, the “forecast errors” are squared differences.

error” for the same series of price points. This is essentially a differences *of the differences*, in that it compares the change in price from one minute to the next, as compared to the average rate of price changes for the prior 30 minutes.

447. The following charts depict the linear forecast error (in orange) and the return forecast error (dotted blue) for the same days of activity graphed above. No matter how the pricing data is looked at, it is undeniable a large, statistically significant swing in prices occurred right during the WM/Reuters Closing Rate fixing window.





448. Additional examples showing price spikes during the WM/Reuters Closing Rate fixing window are contained in Appendix H hereto.

449. *Defendants' quotes around the WM/Reuters Closing Rate fixing window were more closely clustered than quotes by other market participants.* Members of a conspiracy would be expected to be providing quotes of similar levels. Those not in the know would be expected to provide more dispersed price quotes. That is just what Plaintiffs found. Specifically, Plaintiffs studied the “coefficient of variation” for individual quote data. A lower coefficient of variation of individual quotes within a group means that the group was providing price quotes similar to each other, while a higher coefficient means that quotes in that group diverged from each other more. In other words, a lower coefficient means that multiple market participants were clustered together.

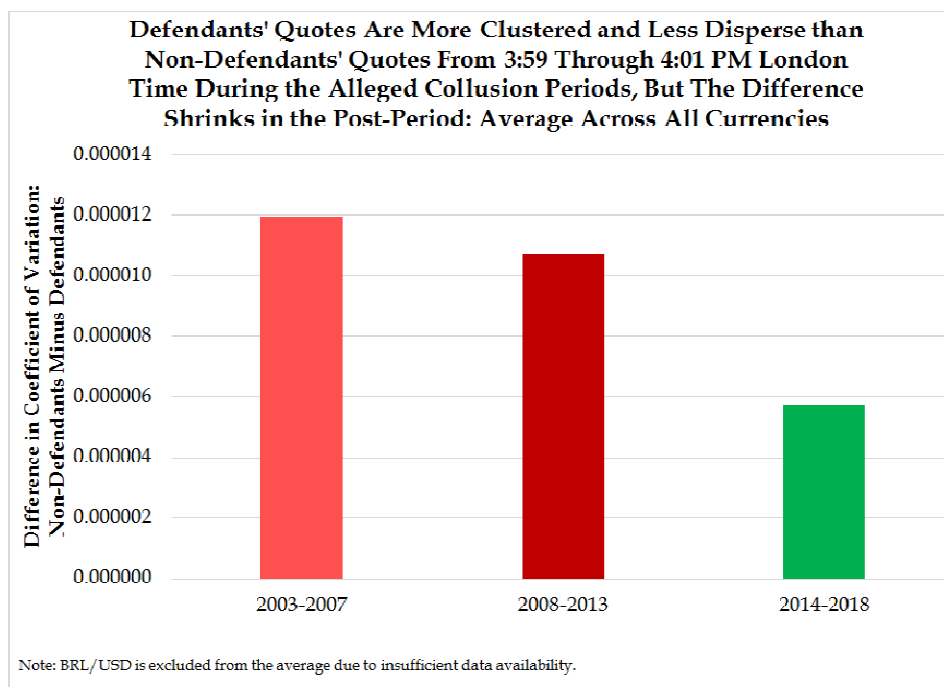
450. Plaintiffs tracked the coefficient of variation of FX spot quotes for the two minute period around the WM/Reuters Closing Rate fixing (i.e., between 3:59 p.m. and 4:01 p.m. London time) between two groups: Defendants, and everyone else. The data show that Defendants' quotes were significantly more clustered together than non-defendants' quotes, from 2013 to 2013. Notably, the relatively high level of clustering of Defendants' quotes was even

higher in the 2003 to 2007 period than it was during the 2008 to 2013 period that Defendants have already admitted to manipulating. This confirms that Defendants were acting as a group to use their quotes to manipulate prices around the fixing window throughout 2003 to 2013.

451. The data also show that the difference between Defendants' and non-defendants' quotes shrunk in 2014 to 2018—i.e., the level of clustering of Defendants' quotes became much more in line with the level of clustering of non-defendants' quotes. This is consistent with a break in Defendants' conspiracy, after their scheme came under public scrutiny.

452. These patterns are illustrated by the chart below, which measures the difference between the coefficient of variation of non-defendants' quotes and the coefficient of variation of Defendants' quotes, across all major currency pairs. A larger bar means that there was a larger difference between non-defendants' more dispersed (and less clustered) quotes and Defendants less dispersed (and more clustered) quotes. A smaller bar means that there was a closer level of dispersion/clustering across Defendants and non-defendants' quotes.

453. As seen below, Defendants' quotes were more closely clustered than non-defendants' quotes, throughout the 2003 to 2013 period. The difference between the clustering of Defendants' quotes and non-defendants' quotes was *even greater* in 2003 to 2007 than it was in 2008 to 2013. This further confirms that Defendants' conspiracy was not limited to 2008 to 2013, but also extended to and had at least equal impact on 2003 to 2007.



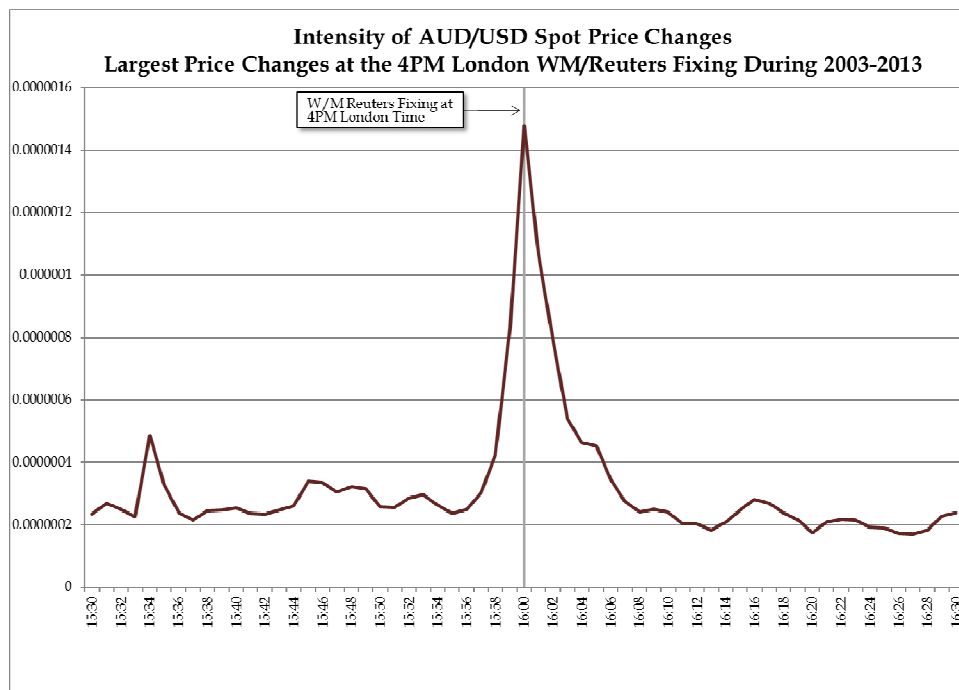
454. In 2014 to 2018, the trend changed: the difference between the coefficient of variation of Defendants' quotes and non-defendants' quotes was significantly less. In other words, Defendants' quotes became less clustered and more dispersed, relative to non-defendants' quotes. That Defendants were moving in relative unison with each other at the time of the fixing, *but not everyone else*, further confirms that Defendants were acting as a group, i.e., as part of a conspiracy, from 2003 to 2013. That that pattern abated during 2014, when Defendants' FX practices started to become under scrutiny, again further confirms Plaintiffs' conclusions cannot be innocently explained away.

455. *Price spikes around the WM/Reuters Closing Rate fixing window were of unusual size and intensity.* That the price spikes studied above were not the result of random chance is also confirmed by the fact that Plaintiffs measured the size and intensity of the price spikes, throughout 2003 to 2013. For the hour around the setting of the WM/Reuters Closing Rate, Plaintiffs compared the price at each minute with the average of the prices during the 10 minutes prior that minute. For example, the price at 4 p.m. London time was compared with the

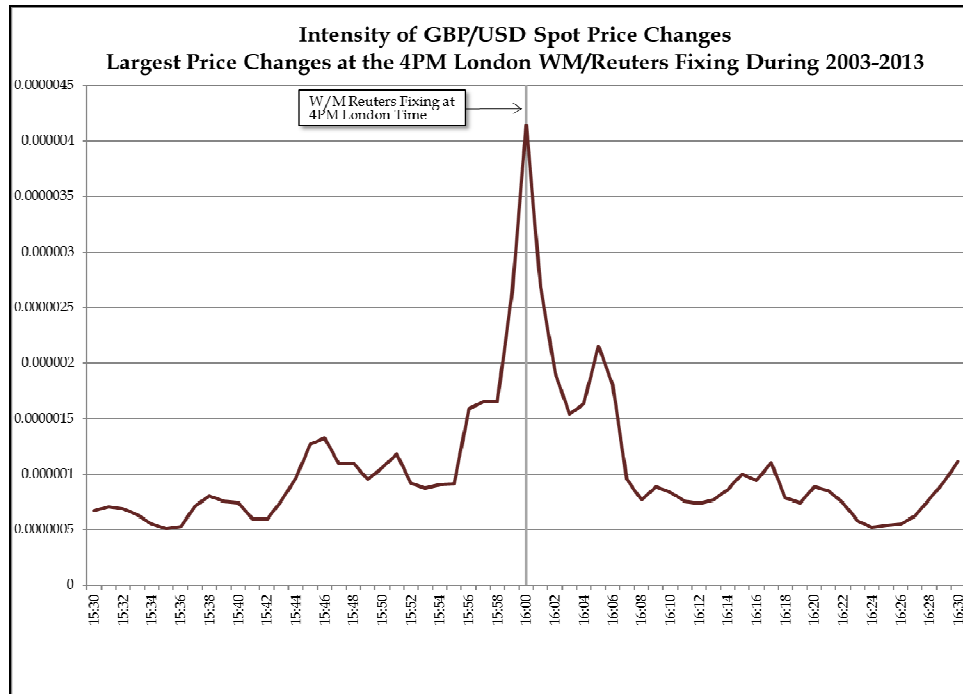
average of prices from 3:50 p.m. through 3:59 p.m. The “squared deviation” between those averages and the price at any one particular minute enables the identification of which minutes experienced the most severe/largest movements.

456. The results of the analysis, like the others, are striking: prices spiked with unique size and intensity right at the time of the WM/Reuters Closing Rate fixing. Put another way, the intensity of the price spikes was much greater when they occurred at the WM/Reuters Closing Rate fixing, than when prices moved at other times. This highly non-random intensity distribution would not be observed if the spikes at the WM/Reuters Closing Rate fixing were due to normal market conditions.

457. For example, the following graphs tracks for AUD/USD spot transactions the intensity of price changes, in which the price at each minute is compared to the average price from 10 minutes before. The results feature unusually large and intense price spikes at the time of the WM/Reuters Closing Rate fixing, which are not observed at any other time during the surrounding period.



458. Similarly large and intense price spikes at the WM/Reuters Closing rate fixing are also seen for many other major currencies that Plaintiffs tested. By way of further example, the charts below track the intensity of price movements for GBP/USD spot transactions.

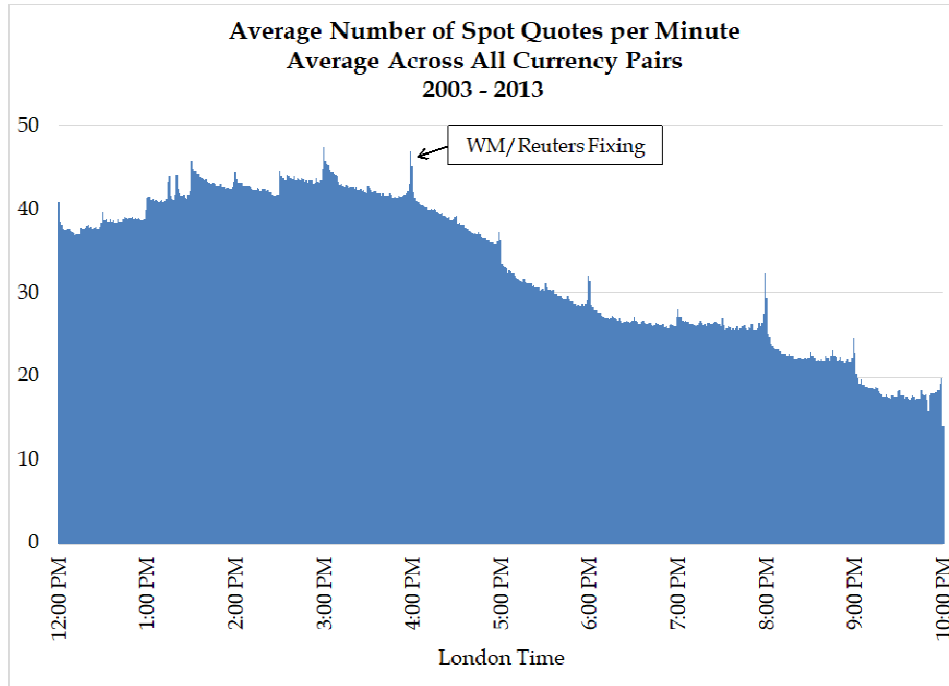


459. Additional examples showing a similar pattern of unusually intense price spikes at the time of the WM/Reuters Closing Rate fixing, for additional currency pairs, are contained in Appendix I hereto.

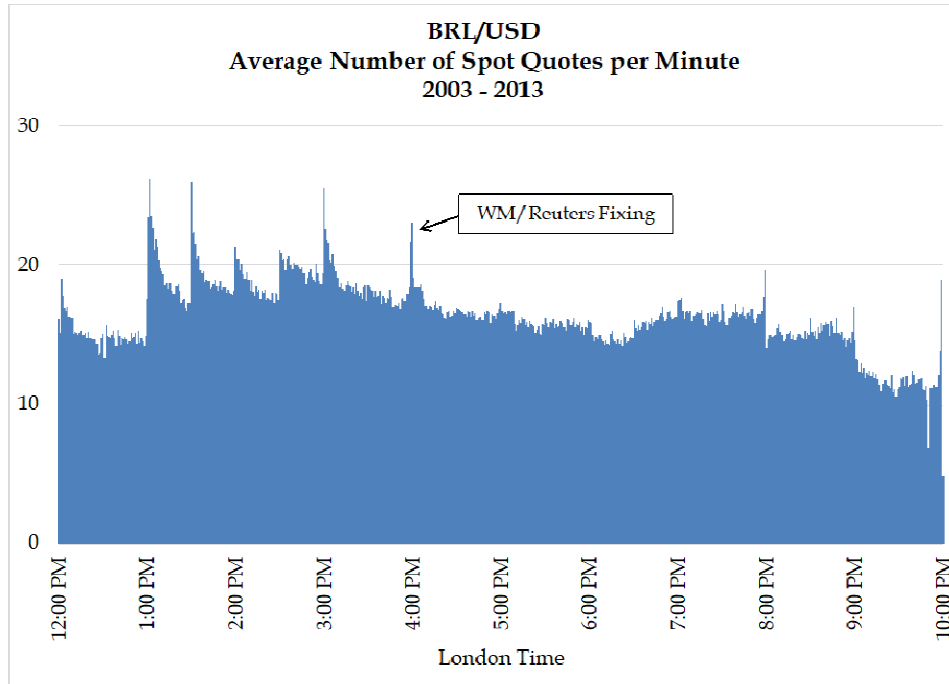
460. *Price spikes around the WM/Reuters Closing Rate fixing window cannot be explained by increased liquidity.* Plaintiffs also considered whether the price spikes around the WM/Reuters Closing Rate fixing window were caused by an increase in liquidity in the FX market. As an initial matter, this hypothesis is implausible because, while the FX market was generally liquid around the WM/Reuters Closing Rate fixing window, it was not uniquely so. Rather, the data shows that the FX market was *even more liquid* at other times of the day, when the prices spikes were not seen.

461. The chart below tracks the average number of spot quotes per minute, for all

major currency pairs, from 2003 to 2013. As the data shows, the WM/Reuters Closing Rate fixing window was not a period of unusual liquidity; in fact, there were other times of day with similarly high or even greater liquidity.



462. That pattern is particularly pronounced for BRL/USD spot transactions. Again, while there was a slight increase in liquidity around the WM/Reuters Closing Rate fixing window, liquidity was not uniquely high at that time, and in fact was higher at other times of day.



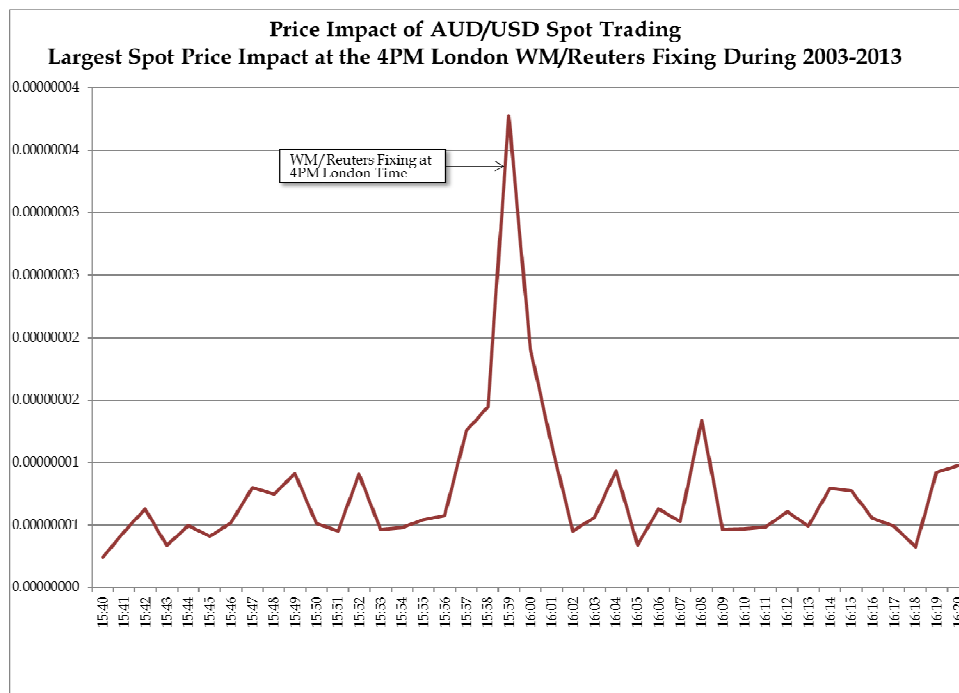
463. Additional examples, for additional currency pairs, further confirming that liquidity was not uniquely high around the WM/Reuters Closing Rate fixing window, are contained in Appendix J hereto.

464. That the price spikes were not a liquidity-driven phenomenon is also confirmed by the fact that prices around the WM/Reuters Closing Rate fixing window acted contrary to the normal expectations for a period of high liquidity. During times of high liquidity, the ability of a single transaction to move the market should be lower than at other times of day. The singular effects of that quote are more likely to be drowned out by the presence of so many others. The relative ability of a trade or quote to move the price in the market is referred to as “price impact.” During very liquid times of the day for which high levels of volume are traded, prices may move meaningfully, but price movements per unit of volume should be lower than when compared to periods of lower liquidity.

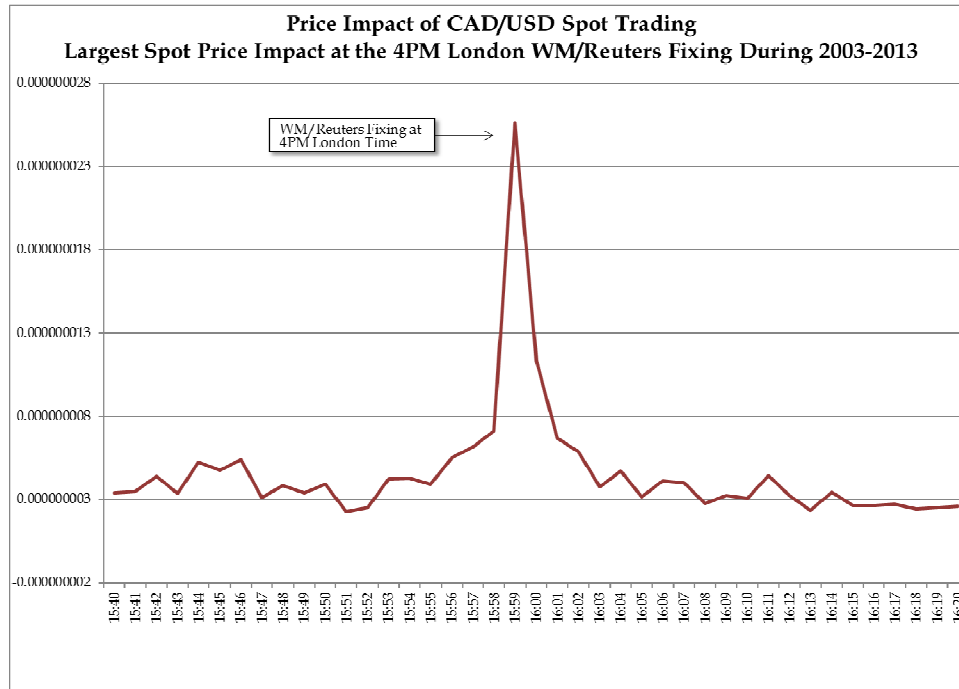
465. The settled economic principles of “price impact” were violated around the WM/Reuters Closing Rate fixing window. If the WM/Reuters Closing Rate fixing coincided

with a liquidity spike in the market, then the price impact of each quote during the fixing should have been lower than quotes at other times. This is the exact opposite of what happened. Each quote during the WM/Reuters Closing Rate fixing window resulted in a *significantly larger* movement than a quote occurring at other times. In other words, prices around the WM/Reuters Closing Rate fixing window behaved in ways that defy logic in an unmanipulated market, even when specifically judged against expectations for a purportedly liquid time of day.

466. For example, the chart below measures the average price impact of AUD/USD spot quotes during the hour around the WM/Reuters Closing Rate fixing window, from 2003 to 2013. The data shows that each quote was *most* impactful during the fixing window. This is directly contrary to the principle of price impact—the power of a single quote to move the market should not peak during a purportedly highly liquid time of day.

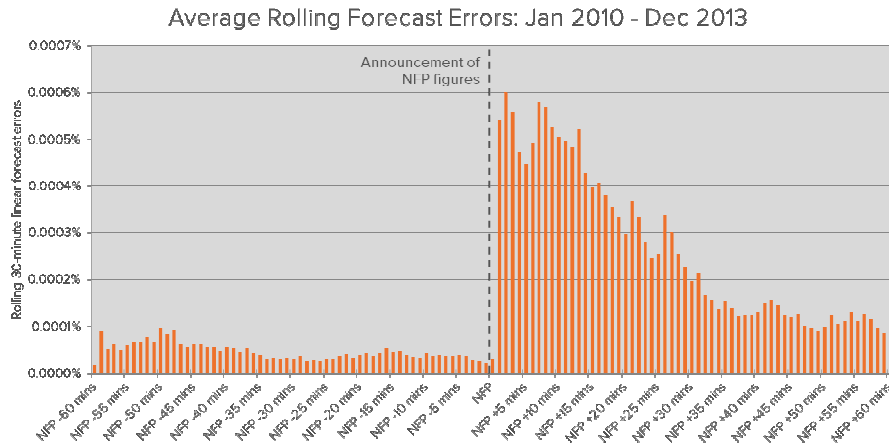


467. A similar pattern is seen for CAD/USD spot quotes. Again, the price impact of each quote did not decline during the WM/Reuters Closing Rate fixing window, as would be expect from a period of high liquidity—but rather surged *upward*.



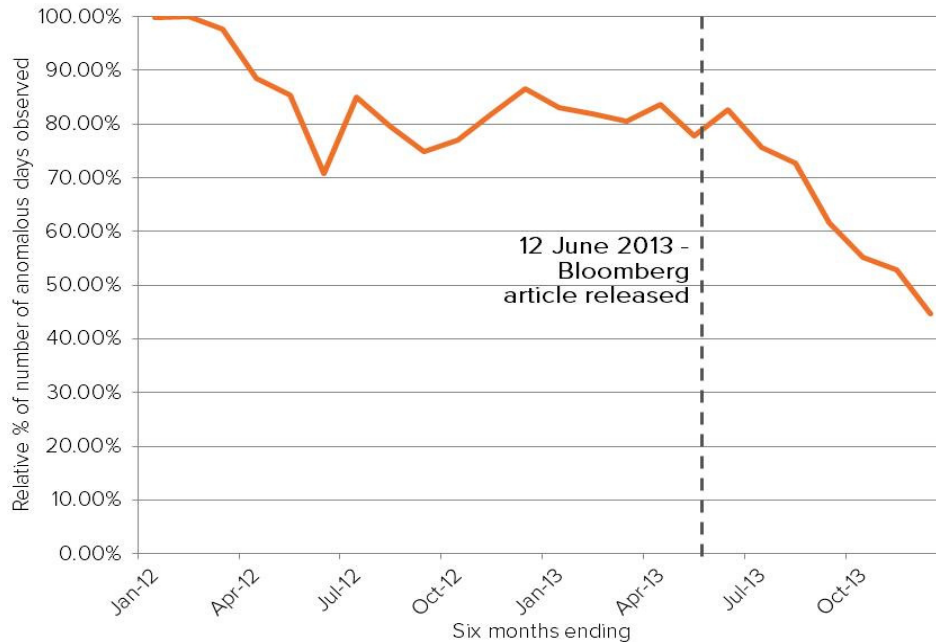
468. Additional examples, for additional currency pairs, showing that the price impact for spot quotes were uniquely high during the WM/Reuters Closing Rate fixing window, are contained in Appendix K hereto.

469. *The price spikes during the WM/Reuters Closing Rate fixing window are not the result of price discovery—i.e., the market rushing to react to new information.* Common-sense dictates that the release of new, non-public information can only impact the market once it is actually released. For instance, the following chart shows the market's reaction of the government's release of payroll data—data that is unlikely to be leaked in advance. As one would expect, the linear forecast error shows a spike in activity *after* the information is released.



470. In contrast, the spikes observed in around the WM/Reuters Closing Rate begin *before* the WM/Reuters Closing Rate is itself announced. The abnormalities around the WM/Reuters Closing Rate fixing window thus could not be a natural reaction to the WM/Reuters Closing Rate itself.

471. *The price spikes abated after news of the FX scandal broke in the summer of 2013.* Notably, anomalous price movements around the WM/Reuters Closing Rate fixing window became rarer and less pronounced after investigations into Defendants' activities began. The following chart indicates the sizeable decrease in anomalous price movement around July 2013:



472. Similarly, *Bloomberg* found that from “July through the end of December, qualifying jumps on the last working day of the month occurred only 10 percent of the time. For several currency pairs, including Japanese Yen to U.S. dollar and U.S. dollar to Canadian dollar, spikes have disappeared altogether. In dollar-euro, the most widely traded pair, the frequency has fallen to 17 percent from 50 percent on the same six days in 2012.”³¹⁹ The sizeable reduction in the number of anomalous days in the wake of increased scrutiny on Defendants’ activities is direct evidence of Defendants’ manipulative practices.

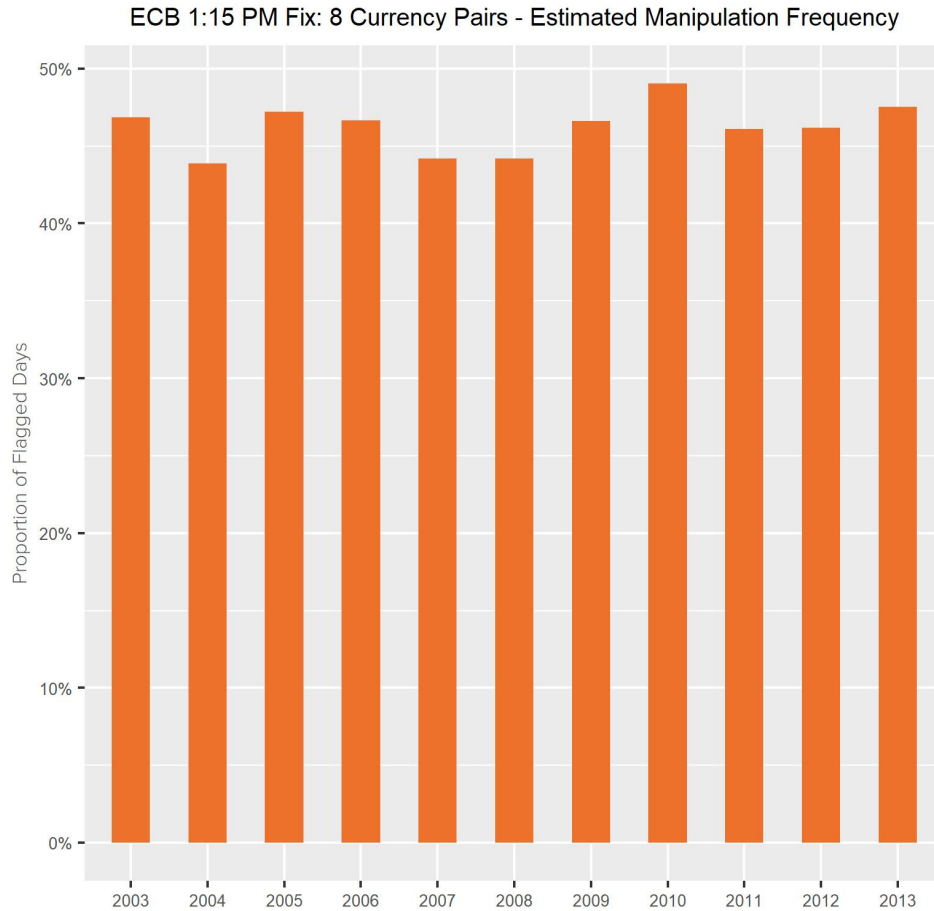
3. Plaintiffs’ economic analyses demonstrate that Defendants’ manipulation of FX prices was not limited to 4 p.m. London time

473. As discussed above, Defendants’ plea deals confirm their manipulation of the willingness, ability, and incentive to carry out a conspiracy to fix prices in the FX market. The data confirms they carried over such willingness, ability, and incentives into trading periods other than the WM/Reuters Closing Rate at 4 p.m. London time. There is no indication that

³¹⁹ Liam Vaughan & Gavin Finch, *London Afternoon Currency Spikes Subside as Regulators Probe*, *Bloomberg* (Jan. 27, 2014), <https://www.bloomberg.com/news/articles/2014-01-27/london-afternoon-currency-spikes-subside-under-regulators-glare>.

Defendants' conspiracy was confined to spot prices during the WM/Reuters Closing Rate fixing window. To the contrary, government regulators have found that Defendants used the same methods and means of communication and conspiracy that they have admitted using to influence the FX spot rate to also manipulate other, key FX benchmark rates, including the ECB Rate at 1:15 p.m. London time.

474. *There was a high frequency of anomalous price movements around the ECB Rate fixing window for every year from 2003 to 2013.* As discussed above, Plaintiffs used volatility-adjusted statistical models and screens to detect anomalous price movements around the setting of the WM/Reuters Closing Rate at 4:00 p.m. London time. Plaintiffs also used the same methodology to detect anomalous price movements around the setting of the ECB Rate at 1:15 p.m. London time. The graph below shows the frequency of identified manipulation days, as a percentage of the total days that the ECB Rate was set, for every year from 2003 to 2013.



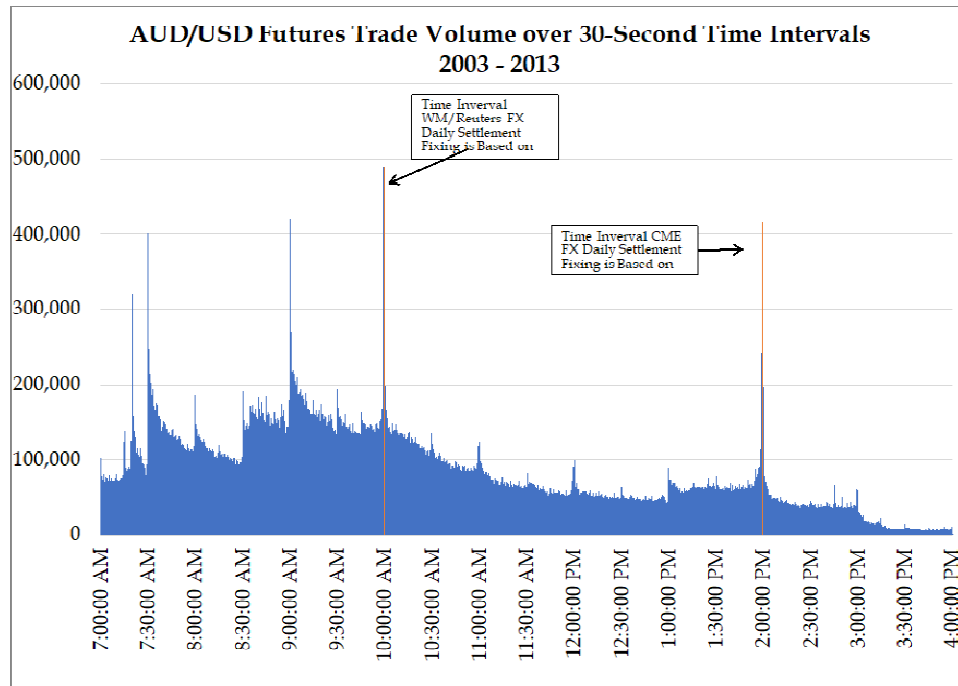
475. As would be expected from a period during which government regulators and the press have also identified a high rate of manipulation, there was a high frequency of manipulation days identified by Plaintiffs' model from 2008 to 2013. During each of those years, the ECB Rate was identified as being manipulated *well over 40%* of the time.

476. This high rate of manipulation was not, however, limited to those years. The preceding years of 2003 to 2007 have a similarly high frequency of identified manipulation days—again, *over 40%* for each of those years as well. In fact, during 2003, 2005, and 2006, the frequency of manipulation days was *over 45%*. Thus, the data further confirms that the ECB Rate was also subject to frequent manipulation, and demonstrates that the manipulation extended throughout the 2003 to 2013 period.

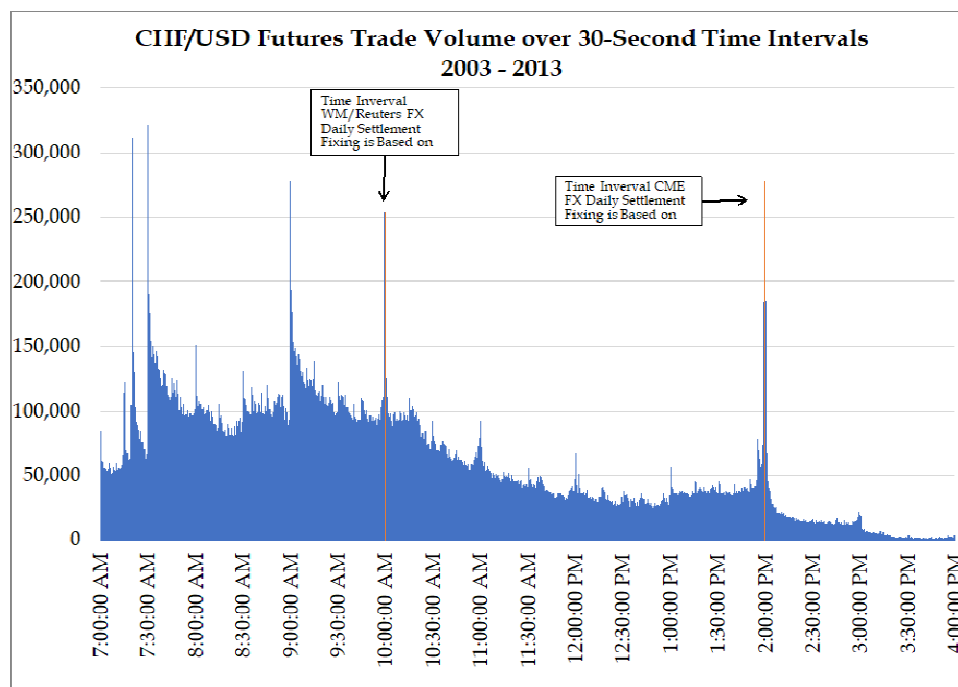
477. *FX trading volume spiked during the CME Daily Settlement Rate fixing window at 2:00 p.m. Central time.* As also discussed above, the CME Daily Settlement Rates are yet another key FX benchmark. They determine, on a daily basis, the cash flows, profits, and losses on FX futures contracts. And they it determine, on a regular basis, whether FX options expire in or out of the money. As also discussed above, the CME Daily Settlement Rates are determined by the volume-weighted average price of trades in the thirty-second window of 1:59:30 p.m. and 2:00:00 p.m. Central time. The use of “screens” helped reveal, and now confirm, the presence of Defendants’ manipulation of the FX market around the WM/Reuters and ECB fixing windows, throughout 2003 to 2013. The use of similar data “screens” has now revealed that Defendants’ collusive practices extended into the key thirty-second measurement window of the CME Daily Settlement Rates fixing window.

478. One straightforward confirmation that the prices were being manipulated around the CME Daily Settlement Rate fixing window is the fact that trading activity during the thirty-second measurement window spiked, year after year, in currency after currency. Often, the volume of activity during that thirty-second window was among the most active thirty-second periods of the day.

479. For instance, the following chart tracks trading activity, in thirty-second intervals, for the AUD/USD currency pair, for 2003 to 2013. The higher the vertical lines, the more volume there was in the market during that time of day. The red line appearing at 2 p.m.—the highest of all the lines—indicates that the trading volume during the thirty-second interval when the CME Daily Settlement Rate was measured was consistently higher than the activity seen at most any other time of day.



480. This same pattern was consistently seen across multiple currency pairs. For example, the following chart again covers the 2003 to 2013 period, but for the GBP/USD currency pair. And it again shows that futures trading activity just so happened to spike during the CME Daily Settlement Rate fixing window.



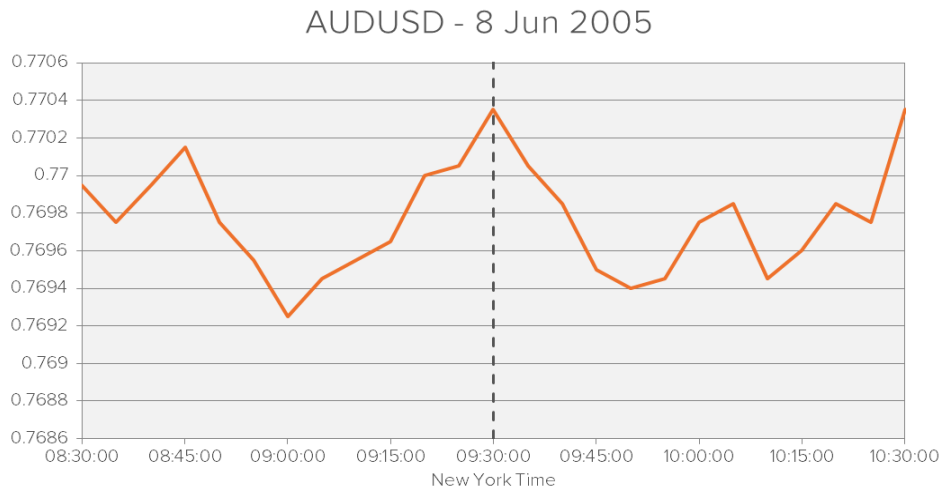
481. Year after year, in currency pair after currency pair, futures trading activity suspiciously spiked during the thirty-second window when the CME Daily Settlement Rates were being measured. There is no other plausible explanation for such a spike in activity, other than that Defendants were once again engaged in a “banging the close” strategy.

482. Additional examples, for additional currency pairs, showing that trading activity spiked during the thirty-second window when the CME Daily Settlement Rates were being measured, are contained in Appendix L hereto.

483. *FX prices spiked during the “rollover” periods for FX futures.* There are also signs that Defendants deployed the same tools of manipulation at other key periods during the life of FX transactions. For instance, many FX futures contracts are closed out prior to expiry on a so-called “rollover date.” To “rollover” a position, traders close out the near-to-expiry contract in advance of expiry and move into a new position in the next expiring contract. This allows the trader to avoid having to make physical delivery on the initial contract.

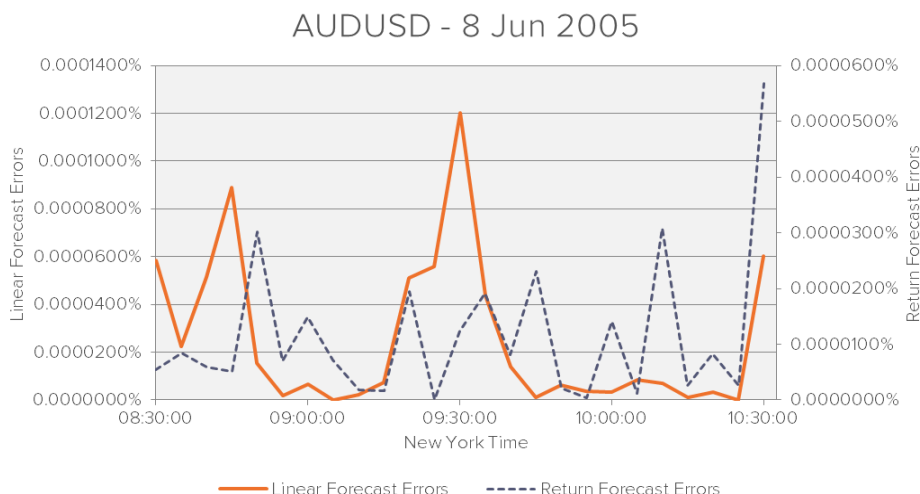
484. While rollovers could occur at any point a trader wants to, by industry practice in fact most FX futures roll over around 9:30 a.m. Eastern time (8:30 a.m. Central time) five business days prior to expiry, with expiry dates coming once a quarter. Like with the measurement windows for the key benchmarks discussed above, the heightened incentive to manipulate during this key trading period proved too tempting for Defendants to resist extending their conspiracy into. An analysis of the trading data finds that, in fact, *statistically significant* trading anomalies can be seen during the FX futures rollover periods.

485. To see what this looks like, consider the following chart, which tracks spot prices³²⁰ for AUD/USD on June 8, 2005, in the time leading up to a traditional rollover period, i.e., 9:30 a.m. Eastern time. One can see that the price spikes up in a relatively short period around the time rollovers would be occurring.



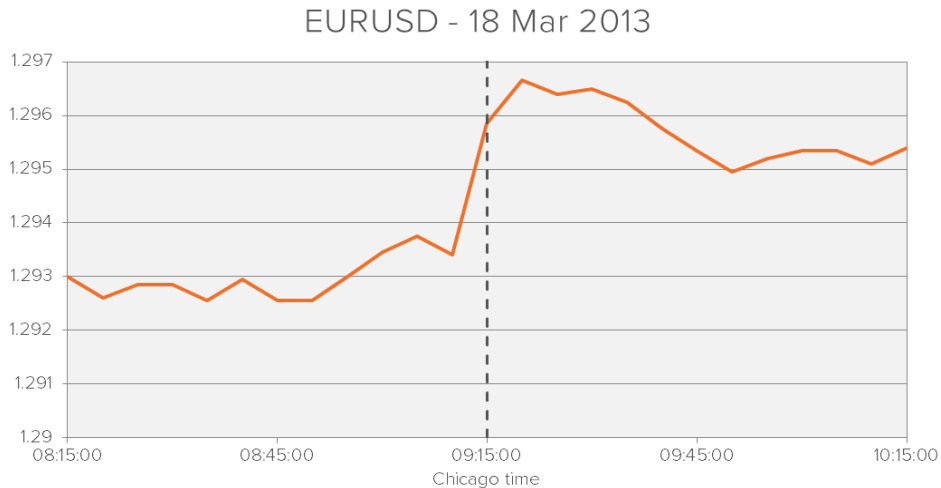
486. As discussed above, a way to measure and depict the amount of sudden change going on is to calculate the “linear forecast error” and “return forecast error” for prices on a given day. In the following chart, the linear forecast error for AUD/USD on June 8, 2005 appears in orange, while the return forecast error appears in dotted blue. No matter how measured, the conclusion is the same: prices were changing in the spot market, quickly, right around the time Defendants would be looking to “roll over” their positions in the futures market.

³²⁰ As discussed above, price movements in the spot market are directly correlated to price movements in the futures market.

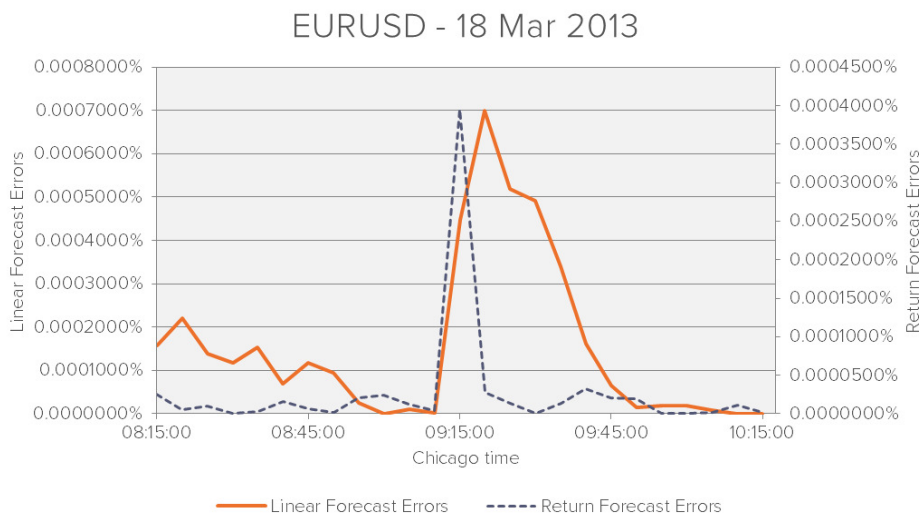


487. ***FX prices spiked during the “final settlement” periods for FX futures.*** FX futures contracts typically settle on the third Wednesday of March, June, September, and December, with trading in those contracts typically ending two business days prior. This is known as the “final trading day.” Between 9:15:30 a.m. and 9:16:00 a.m. Central time on these once-a-quarter days, the final settlement price of FX futures contracts are determined. This represents yet another moment in time when the incentives to manipulate were particularly heightened, apart from the daily manipulations in the London Fix (4 p.m. London time/10 a.m. Central time), the daily manipulations in the CME Daily Settlement Rate (10 a.m. Central time), and even apart from the quarterly roll-over times (9:30 a.m. Eastern time/8:30 a.m. Central time).

488. Again, across no less than nine currency pairs, the available data reveal statistically significant, anomalous movements in the FX market on many of these key “final trading days.” For example, the following chart tracks the spot price for EUR/USD on March 18, 2013, a “final trading day.” One can see a large spike occurring just before the key calculation was going to be made on all soon-to-expire contracts.



489. As in the preceding section, the following chart provides the “linear forecast error” and “return forecast error” for that same day. Again, the result is striking: a clear spike in movement right at the key measurement period.



III. ADDITIONAL EVIDENCE THAT DEFENDANTS COLLUDED TO ARTIFICIALLY INFLATE FX BID/ASK SPREADS

490. As explained above, the bid/ask spread is the primary means by which Defendants, as dealers, profited from each FX trade. The larger the difference between the bid and the ask, the greater the profits Defendants were able to extract from each transaction. Thus, Defendants had every incentive to inflate the size of bid/ask spreads, rather than adopt the

narrower spreads that would be set by a truly competitive marketplace. Defendant acted on that incentive by colluding to maintain artificially wide bid/ask spreads in FX transactions, and prevent the competitive marketplace from narrowing the spreads (and their profits).

A. Chat Transcripts Demonstrate Defendants' Collusion to Manipulate FX Bid/Ask Spreads

491. As discussed above, many government regulators have found that Defendants colluded to inflate FX bid/ask spreads. For instance, the DFS found that traders at Barclays colluded with traders at JPMorgan and Standard Chartered to artificially inflate the spreads that they charged their customers. The South African Competition Commission similarly found that traders at Barclays, BNP Paribas, BofA, Citi, Credit Suisse, JPMorgan, and HSBC colluded to manipulate bid/ask spreads for USD/ZAR, and referred the claims to the Competition Tribunal.³²¹ Citi has already settled the claims against it.³²² The Federal Reserve found that Citi, JPMorgan, RBS, and UBS may have “formed agreements with traders of other institutions regarding bid/offer spreads offered to FX customers.”³²³ Similarly, the OCC found that the

³²¹ SACC Press Release, *Competition Commission prosecutes banks (currency traders) for collusion* (Feb. 15, 2017), <http://www.compcom.co.za/wpcontent/uploads/2017/01/Competition-Commission-prosecutes-banks-currency-traders-for-collusion-15-Feb-2016.pdf>.

³²² SACC Press Release, *Competition Commission reaches settlement with Citibank N.A. for colluding* (Feb. 20, 2017), <http://www.compcom.co.za/wpcontent/uploads/2017/01/Competition-Commission-reaches-settlement-with-Citibank-3.pdf>.

³²³ Order to Cease and Desist, at 4, *In the Matter of UBS AG, et al.*, Dkt. No. 15-005 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a6.pdf>; Order to Cease and Desist, at 4, *In the Matter of The Royal Bank of Scotland PLC, et al.*, Dkt. No. 15-007 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a4.pdf>; Order to Cease and Desist, at 4, *In the Matter of Citigroup Inc.*, Dkt. No. 15-008 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a5.pdf>; Order to Cease and Desist, at 4, *In the Matter of JPMorgan Chase & Co.*, Dkt. No. 15-009 (May 20, 2015), <https://www.federalreserve.gov/newsevents/pressreleases/files/enf20150520a2.pdf>.

members of the “The Cartel,” including Richard Usher and Rohan Ramchandani, “disclos[ed] discuss[ed], and coordinat[ed] currency pair spreads,” including spread matrices³²⁴

In addition, media reports indicate that the DOJ is currently investigating collusive manipulation of bid/ask spreads by Defendants.³²⁵

492. Many regulators have included with their orders, notices, agreements, and reports, extracts from thousands of electronic chat transcripts obtained from Defendants, which describe specific instances of collusive spreads manipulation. Each of those orders, notices, agreements, and reports is incorporated by reference in this Complaint. A sample of the chat transcripts is included herein.

493. For example, the DFS found that, on November 4, 2010, a Barclays FX trader coordinated the price offered to a customer in the USD/ZAR pair with a JPMorgan trader. The Barclays trader said to the JPMorgan trader: “if you win this we should coordinate we can show a real low one and will still make it little lower haha.” The JP Morgan trader then suggested that “they prolly shudnt put this on perma chat.” The Barclays trader replied that “if this is the chat that puts me over the edge than oh well. much worse out there.”³²⁶

³²⁴ Notice of Charges, at ¶¶ 44, 47-48, *In the Matter of Rohan Ramchandani*, OCC AA-EC-2017-2 (Jan. 11, 2017), <https://www.occ.gov/static/enforcement-actions/eaN17-001.pdf>; Notice of Charges, at ¶¶ 46, 49-50, *In the Matter of Richard Usher* (Jan. 11, 2017), <https://www.occ.gov/static/enforcement-actions/eaN17-002.pdf>.

³²⁵ Erik Larson, Tom Schoenberg, and Chris Dolmestch, *As Big Banks’ FX Case Ends, Judge Urges Probe of Traders*, Bloomberg (Jan. 5, 2017), <https://www.bloomberg.com/news/articles/2017-01-05/rbs-jpm-citi-barclays-fined-2-5-billion-in-fx-rigging-case>; Tom Schoenberg and David McLaughlin, *Trader Talk in Currency-Rigging Suit Draws Scrutiny From U.S.*, Bloomberg (Jan. 21, 2016), <https://www.bloomberg.com/news/articles/2016-01-21/trader-talk-in-currency-rigging-suit-draws-scrutiny-from-u-s>.

³²⁶ Consent Order, at ¶ 34, *In the Matter of Barclays Bank PLC, et al.* (May 20, 2015), <http://www.dfs.ny.gov/about/ea/ea150520.pdf>.

494. The DFS also found that the same trader, on November 10, 2010, told other members of his chat room to “show them way to the left . . . if they come here I will show them little worse . . . you win . . . and get them cheap.”³²⁷ The same trader, on February 25, 2011 received an inquiry from a Standard Chartered Bank FX trader: “what bid you want me to show if somwone calls” and the Barclays trader replied “up to 02.” The Standard Chartered trader said “okok” and “ill let you know if we get asked.” On June 10, 2011, the Barclays trader stated in another chat that “we trying to manipulate it a bit more in ny now . . . a coupld buddies of mine and i.” This trader left Barclays that month and joined another bank, where he engaged in the same conduct.

495. In their BNP Paribas consent order, the DFS found that BNP Paribas colluded with other banks to manipulate the bid/ask spread in ZAR Domination. For example, in January 2012, for example, Christopher Cummins told the chatroom that he had received an order to buy \$50 million of Rand. Cummins then asked, “250 pips? 300?” He also shared the fact that he had shown his customers a spread of 125 basis points for a \$20 million order and 250 basis points for a \$50 million order. Jason Katz replied, “ill match ... lets widen this out on people . . . if we all consistent...it becomes standard ahah.” Cummins offered his agreement, as did another trader from a large global bank (“Trader A”), noting “tht way 250 is the new 200.” Thus, the ZAR Domination cartel colluded to widen the spread on a \$50 million order from 200 pips to 250 pips. Later, Trader A asked Katz to recruit yet another trader (“Trader B”) to their team, and Katz agreed. He wrote to Trader B in a different chat room: “hey dude we all agreed the new price in 50 bucks ny time is 250 and 125for 20 we going to try and get this wider ... if we all consistent they have to except [sic] it.” Trader B then joined in on the plan. When Katz informed his

³²⁷ *Id.* ¶ 35.

fellow ZAR Dominators that Trader B was on board, Katz said “i have one word for BNP . . . guarantee.” Trader A offered his congratulations to the group: “salute to first coordinated ZAR effort,” and Katz replied “yep many more to come.”³²⁸

496. That day, Katz also attempted to recruit a former colleague who traded at another bank (“Trader C”) by saying “a bunch of us have decided to widen spreads a bit in ny afternoon . . . we making 125 in 20 and 250 in 50 . . . going to get custys to except [sic] wider . . . figure if we all consistent they [customers] have to accept it . . . [three banks] all in for it.” Katz also asked Trader C to let another trader at C’s bank know about the “new” collusion-fueled price.³²⁹

497. In March 2012, Katz complained about “silly” banks that refused to play ball and were offering narrower spreads. He admonished the other ZAR Dominators to maintain solidarity and enhance their market influence: “my spread is my spread . . . if we all in ny keep the same spread that will become the norm . . . we set the spreads . . . and we stand by them . . . 50 in ny is 200 . . . 25 in ny is 125 . . . you guys agree or am i off.” Other members of the cartel then agreed to adhere to the quotes. Katz then summarized, with bold and hubristic self-awareness, the chief harm of their agreement: “that is what we show in ny . . . custys dont like oh well . . . where they going to go?”³³⁰

498. DFS found that a trader at an unidentified bank asked for assistance setting a spread from a Credit Suisse trader: “Need a quick favour pls” and inquired about where the Credit Suisse trader was marking CHF/JPY futures, because a customer was looking to “pick [the other Trader] off.” After the Credit Suisse trader revealed his prices, the other traded

³²⁸ Consent Order, at ¶¶ 24-27, *In the Matter of BNP Paribas S.A., et al.* (May 24, 2017), <http://www.dfs.ny.gov/about/ea/ea170524.pdf>.

³²⁹ *Id.* at ¶ 28.

³³⁰ *Id.* at ¶ 29.

revealed “[s]o after I asked u the chfjpy, I shifted my price by like .4 higher . . [and the customer] still paid me . . . oh maaaaaaan.” The Credit Suisse trader responded “haha.”³³¹

499. On another occasion, a Credit Suisse trader said to his colleagues in a chat room “lets sign a pact...on spreads.” Trader 3, at another bank, eagerly responded, “agree.” The Credit Suisse trader then tried to recruit a Trader 2, at another bank, into their pact, saying “[Trader 2]... u in?”

500. Similarly, the OCC found that, on January 5, 2012 a member of The Cartel chatroom asked “how wide to quote a customer in \$150 million of EUR/USD.”³³² The trader stated that he “showed a spread of six but that the customer was asking for a spread of five.” The other participants in the Cartel confirmed that a spread of six would be “great,” so the trader “thanked the others” and “declined to quote a spread of five to the customer.” Shortly thereafter, other traders informed the chat room “that the customer also requested quotes from them and that they also showed a spread of six.”

501. Plaintiffs in *In re FX* have also obtained from Defendants many chat transcripts further demonstrating that Defendants colluded to manipulate bid/ask spreads. Many of those chat transcripts are described in the TAC. Many of the chats included in the TAC are in redacted form, because they are subject to the protective order and the class action is subject to a discovery freeze at the request of the DOJ.

502. The plaintiffs in *In re FX* allege that they have obtained three main types of evidence of bid/ask spread manipulation. First, there are chats showing that the Defendants coordinated in the creation of spread matrices; second, there are chats showing coordination in

³³¹ Consent Order, *In the Matter of Credit Suisse AG, et al.* (Nov. 13, 2017), <http://www.dfs.ny.gov/about/ea/ea171113.pdf>.

³³² Notice of Charges, at ¶ 46, *In the Matter of Rohan Ramchandani*, OCC AA-EC-2017-2 (Jan. 9, 2017), <https://www.occ.gov/static/enforcement-actions/eaN17-001.pdf>.

bid/ask quotes generally; and third, there are chats showing collusion in the setting of bid/ask spreads for emerging market currencies.

503. *Coordination of spread matrices.* A spread matrix is provided “to certain customers on a periodic (usually quarterly) basis,” and they “list the bid/ask spreads for various volumes and currencies.” A spread matrix is similar to a price list, and it is one of the primary methods by which banks compete because customers are attracted to the narrowest bid/ask spread. Therefore, when banks collude on their spread matrices, they agree *ex ante* to fix prices—and not to compete—over a period of several months. Time after time, the chats obtained by the FX class plaintiffs show that the Defendants did exactly that. *See* TAC ¶¶ 145-48. For example:

- In “The Cartel,” traders from Barclays, Citigroup, and UBS conspired to fix the spread matrices for EUR/USD from 10:42:13 UTC to 10:50:39 UTC, on a date that is not publicly available.
- In “Essex Express,” traders from MUFG, RBS, and Barclays conspired to fix the spread matrices for EUR/JPY from 9:50:14 UTC to 9:52:02 UTC, on a date that is not publicly available.
- Traders from UBS and Deutsche Bank colluded on spread matrices from 9:42:52 UTC to 9:45:21 UTC, on a date that is not publicly available.
- In a one-on-one chat, a trader from UBS and a trader from an unknown bank agreed to fix prices in their spread matrices from 8:28:51 UTC to 8:37:10 UTC on a date that is not publicly available for the following currency pairs: GBP/NOK, CAD/CHF, NOK/CAD, and CAD/JPY.

504. *Bid/ask quote fixing.* The Defendants also coordinated their bid/ask spreads on a more *ad hoc* basis by fixing individual quotes. The FX class plaintiffs obtained many specific instances of this misconduct. *See* TAC ¶¶ 150-65. For example:

- In “Essex Express,” traders from BOTM, RBS, Barclays, and UBS discussed plans to reach out to other Defendants to artificially inflate the spread, and they complained that the spreads were too narrow in USD/JPY and EUR/JPY.

- Traders from JPMorgan, Citigroup, and Barclays reached an agreement on a price to offer a customer from 14:13:57 UTC to 14:16:54 UTC on a date that is not publicly available. The customer was then offered the agreed-upon spread.
- Members of “Essex Express,” including traders from BOTM, RBS, and Barclays coordinated to widen the spread for EUR/CHF from 7:15:16 UTC to 8:08:42 UTC on a date that is not publicly available.
- In “Sterling Lads,” traders from HSBC, Barclays, and UBS fixed the spread for GBP/USD from 7:52:59 UTC to 7:54:08 UTC on a date that is not publicly available. On another date, traders from Credit Suisse and RBS fixed the spread for EUR/GBP from 10:46:55 UTC to 10:48:35 UTC.
- In “Sterling Lads,” from 8:56:47 UTC to 9:00:05 UTC on a date that is not publicly available, traders from Barclays, RBS, and UBS exchanged confidential customer information before agreeing on a EUR/GBP spread to offer a customer.
- Traders from Citigroup and Deutsche Bank coordinated their spread quotes after exchanging real-time trading information about multiple currency pairs with traders from Barclays, UBS, and RBC. From time to time, traders from BofA also participated in this chat. From 17:31:14 UTC to 17:35:18 UTC, Deutsche Bank and Citigroup agreed on a spread for euro (EUR)/Australian dollar (AUD).
- In a Reuters chat room, from 10:02:44 UTC to 10:11:02 UTC on a date that is not publicly available, traders from Deutsche Bank and UBS discussed fixing spreads for EUR/GBP.
- In “the Barrier Killers,” traders from BofA, Credit Suisse, RBC, and UBS routinely coordinated the spreads for the euro (EUR)/Polish zloty (PLN). For example, traders from Credit Suisse and RBC fixed the spread for EUR/PLN from 8:49:13 UTC to 8:52:54 UTC on a date that is not publicly available.
- Traders from Barclays, BNP Paribas, Citigroup, Deutsche Bank, RBC, RBS, and UBS used an unnamed permanent chat to coordinate spreads involving the Canadian dollar, New Zealand dollar, and U.S. Dollar. This chatroom was active from at least early 2008 to late 2012. On one date that is not publicly available, traders from Deutsche Bank, Citigroup, and RBC discussed spreads for NZD being traded in New York City from 12:24:34 UTC to 1:58:03 UTC. On another date that is not publicly available, an RBC trader provided the spreads that he was currently quoting to the group from 10:17:29 UTC to 10:18:00. On yet another occasion, traders from RBC asked about spreads involving EUR/CHF and AUD/JPY from 19:50:47 UTC to 20:38:47 UTC on an unknown date.
- In a permanent chat called “Slllaaaaggggsssss2,” traders from Barclays, Credit Suisse, HSBC, RBS, and UBS discussed manipulating both spreads and fixes from 14:49:16 UTC to 15:05:19 UTC on a date that is not publicly available.

- In an unidentified chatroom on a date that is not publicly available, traders from BofA, Citi, HSBC, JPMorgan, Standard Chartered, and UBS discussed the EUR/CHF spread and the imminent WM/Reuters fix from 13:16:45 UTC to 13:23:04 UTC.
- Sometimes the traders used nicknames to describe the currency pairs that they were manipulating, such as JPMorgan, Merrill Lynch, and Morgan Stanley using “kiwi” for NZD/USD on a date that is not publicly available from 2:04:13 UTC to 2:08:36 UTC, or Morgan Stanley, JPMorgan, and UBS using “cable” for GBP/USD on a date that is not publicly available from 1:58:58 UTC to 2:00:26 UTC.

505. *Manipulation of Developing Markets.* While Defendants sometimes spoke in code for major currencies, they were considerably more brazen for developing currencies. For instance, in the “Barrier Killers” chatroom, traders from BofA, Credit Suisse, and RBC “discussed the appropriate spread to quote on USD/ZAR” from 13:06:20 UTC to 13:10:20 UTC.³³³ SG, BNP Paribas, HSBC, RBC, RBS, and UBS had similar discussions in an unidentified permanent chat room. And on one date which is not publicly available, traders from BNP Paribas, HSBC, and SG discussed spreads for USD/THB and USD/MNX from 10:06:24 UTC to 10:22:46 UTC.

B. Economic Analyses Further Demonstrate that Defendants’ Manipulated FX Bid/Ask Spreads

506. As discussed above, there is ample evidence from government investigations and the materials obtained by plaintiffs in *In re FX* that Defendants colluded to artificially inflate FX bid/ask spreads. Based on this evidence, the court in *In re FX* upheld the class plaintiffs’ claims for bid/ask spread manipulation.³³⁴

507. Plaintiffs commissioned independent economic analyses to supplement the publicly available evidence of bid/ask spread manipulation. Again, Plaintiffs used conservative assumptions and a number of screens to strip out price movements that might otherwise be

³³³ See TAC ¶¶ 169-70.

³³⁴ See *In re FX*, 2016 WL 5108131, at *2-5 (S.D.N.Y. Sept. 20, 2016).

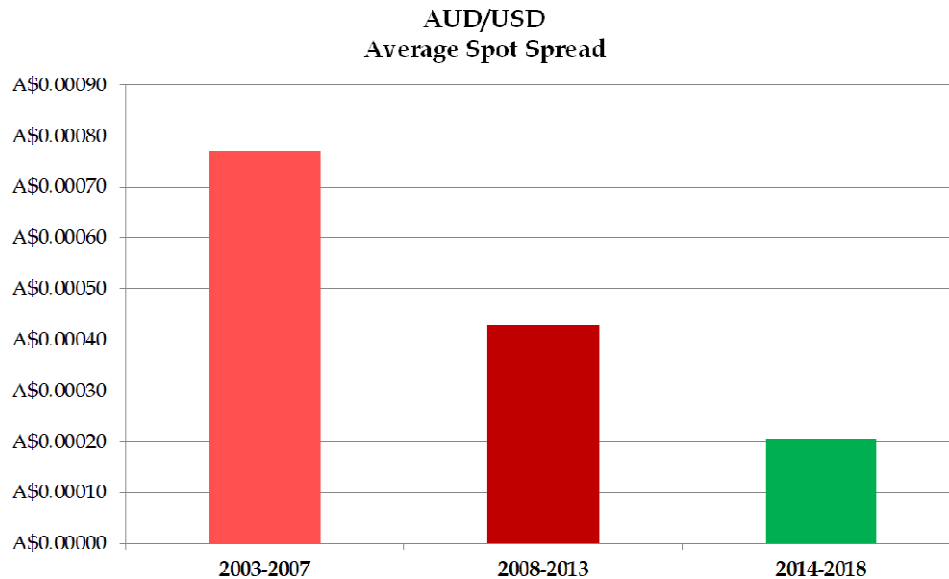
attributed to non-manipulative market behavior. As with the analyses of FX benchmark rates, Plaintiffs' analyses not only corroborate the existing evidence of bid/ask spread manipulation; they go beyond the 2008 to 2013 period and show that the same anomalous patterns occurred, to a similar degree, in the preceding years of 2003 to 2007. Thus, Plaintiffs' analyses again not only confirm that Defendants manipulated FX bid/ask spreads, but also demonstrate that Defendants' conspiracy extended to the entire 2003 to 2013 period.

1. Bid/ask spreads were substantially and consistently larger throughout 2003 to 2013 than they were after the FX scandal broke

508. Plaintiffs analyzed the average size of bid/ask spreads in the FX spot market across major currency pairs, from 2003 to 2018. The data show that bid/ask spreads were substantially and consistently larger throughout 2003 to 2013 than they were after journalists and regulators across the globe began investigating Defendants' manipulation of the FX market. This analysis corroborates the aforementioned evidence that FX bid/ask spreads were artificially inflated, and that Defendants were responsible. In addition, the analysis shows that the same (and oftentimes *greater*) signs of bid/ask spread manipulation are seen in the 2003 to 2007 period, as in the 2008 to 2013 period that the court in *In re FX* has already upheld. Thus, Plaintiffs' analysis demonstrates that Defendants' conspiracy to manipulate bid/ask spreads also extended to the entire 2003 to 2013 period.

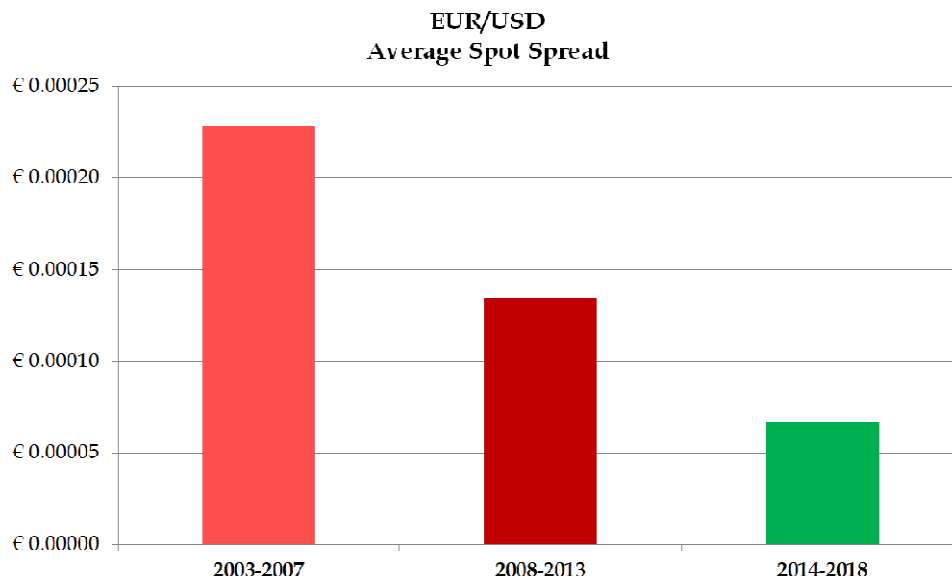
509. For instance, the graph below shows the average size of spreads for AUD/USD spot transactions for 2003 to 2007, 2008 to 2013, and 2014 to 2018. As would be expected from a period that Defendants have admitted to manipulating, bid/ask spreads were substantially wider in 2008 to 2013 than they were in 2014 to 2018, when Defendants' misconduct in the FX market came under public scrutiny. Significantly, bid/ask spreads for this currency pair were *even greater still* in 2003 to 2007. This shows that Defendants' conspiracy was not limited to 2008 to

2013, but also extended to and had at least equal impact on 2003 to 2007.



Note: The spread for each date range is the average of daily spreads calculated over minute-level volume-weighted average prices from 7am to 5pm Eastern Time.

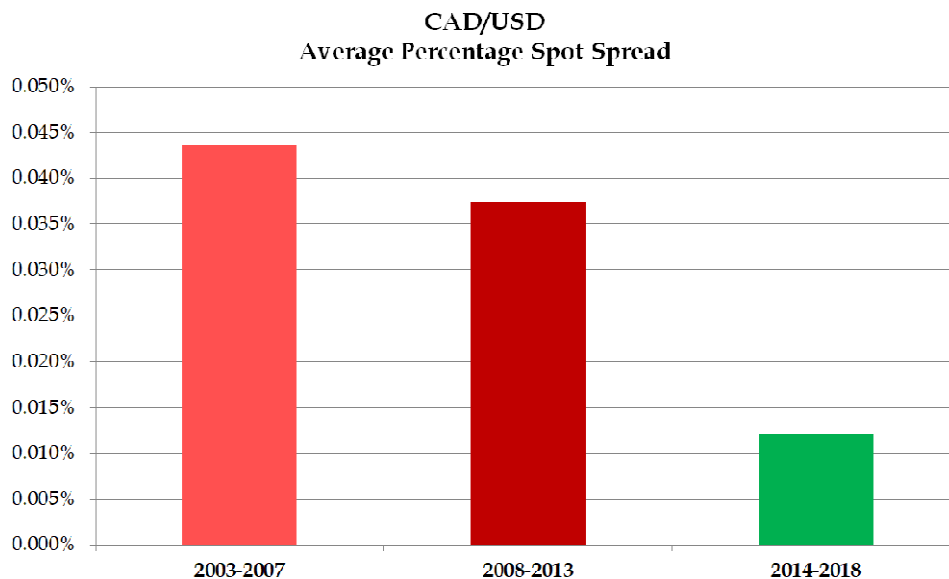
510. The graph below shows a similar pattern in the bid/ask spreads for EUR/USD spot transactions. Bid/ask spreads for that currency pair were significantly larger in 2008-2013 than they were in 2014, and even larger still in 2003 to 2007.



Note: The spread for each date range is the average of daily spreads calculated over minute level volume weighted average prices from 7am to 5pm Eastern Time.

511. The graphs above track the size of the average “dollar spread,” which is simply the difference between the bid price and the ask price, in dollar terms. Another way to measure the size of a bid/ask spread is by the “percentage spread,” which is calculated by taking the difference between the bid price and the ask price, and dividing that by the midpoint of the spread. The resulting percentage gives the size of the spread, relative to the size of the transaction. Using the percentage spread, the same pattern of substantially inflated spreads is seen, across many currency pairs, and across the entire 2003 to 2013 period.

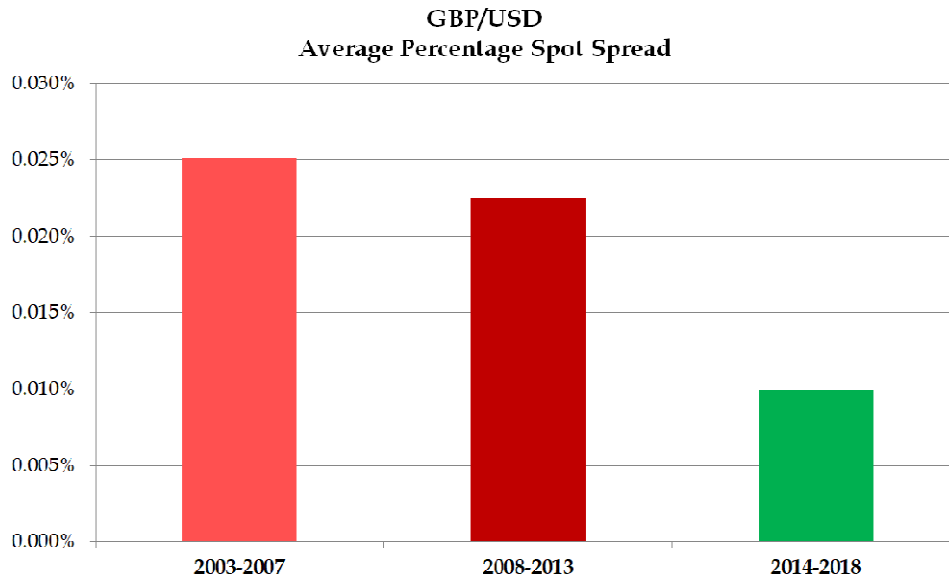
512. For example, the graph below tracks the size of the average percentage spreads for CAD/USD spot transactions. During both the 2003 to 2007 and 2008 to 2013 periods, the average percentage spreads were significantly larger than they were in 2014, when Defendants’ misconduct in the FX market came under public scrutiny. Notably, the average percentage spreads for this currency pair were *even larger* in 2003 to 2007, than in 2008 to 2013.



Note: The spread for each date range is the average of daily spreads calculated over minute-level volume-weighted average prices from 7am to 5pm Eastern Time.

513. The same pattern is seen for GBP/USD spot transactions. The size of the average percentage spreads for that currency pair dropped significantly from the 2008 to 2013 period, to

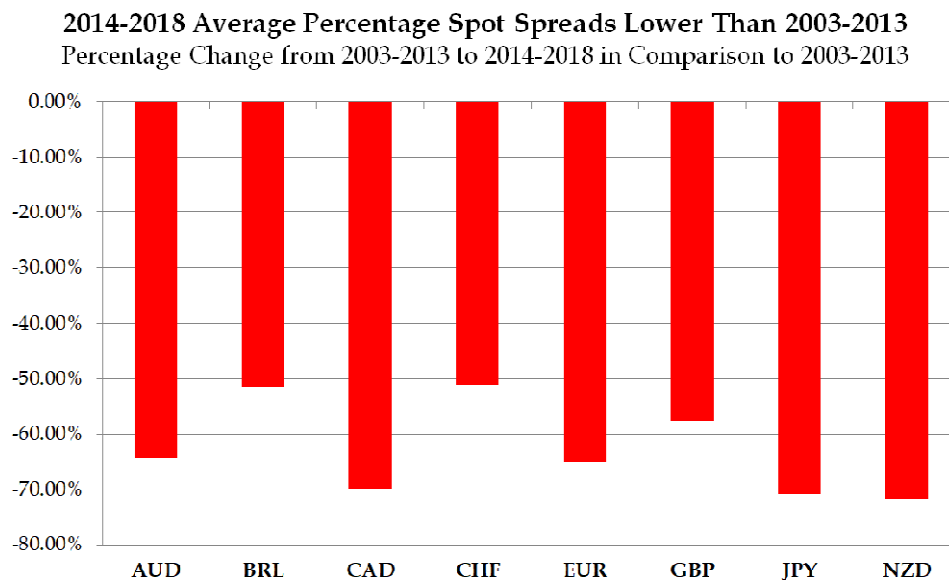
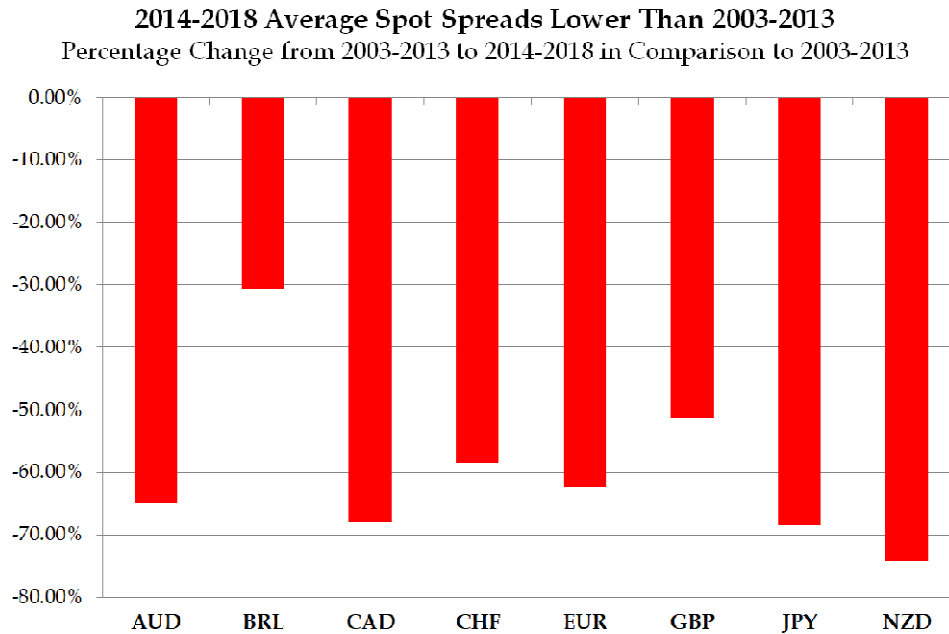
the 2014 to 2018 period—and by *an even greater* amount from the 2003 to 2007 period, to 2014 to 2018.



Note: The spread for each date range is the average of daily spreads calculated over minute-level volume-weighted average prices from 7am to 5pm Eastern Time.

514. Additional examples showing a similar pattern in the average spreads for many other currency pairs are contained in Appendix M hereto.

515. That bid/ask spreads significantly tightened following the investigations into Defendants' manipulation of the FX market is further confirmed by viewing the percentage by which spreads changed in size in 2014 to 2018, as compared to the prior decade. The graphs below show the percentage change from 2003-2013 to 2014-2018, for both average dollar and average percentage spreads. Across eight major currency pairs, spreads consistently and significantly dropped in size in 2014 to 2018, as compared to preceding years. In fact, most of those currency pairs, including EUR/USD, experienced a decrease in both dollar and percentage spread size of *over 50%*.



2. Bid/ask spreads were more predictable during 2003 to 2013 than after the FX scandal broke

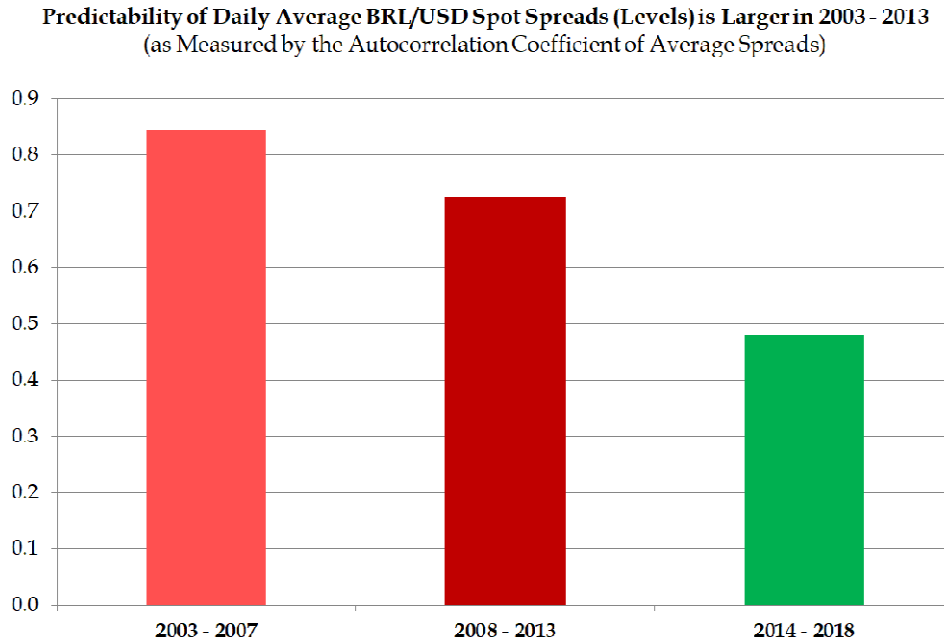
516. Another way to detect manipulation of bid/ask spreads is by studying the predictability of spreads from one day to the next. In a normally functioning market, bid/ask

spreads will fluctuate from day to day, according to market conditions. By contrast, when spreads are more consistent from day to day, that is a sign that they are being fixed at an artificial level.

517. Plaintiffs measured the predictability of bid/ask spreads on a daily basis, from 2003 to 2018. Across *all* of the major currency pairs tested, Plaintiffs found that bid/ask spreads were far more predictable on daily basis from 2008 to 2013 than they were in 2014 to 2018, when Defendants' misconduct came under public scrutiny. This is no surprise, as many Defendants have admitted to manipulating the FX market from 2008 to 2013.

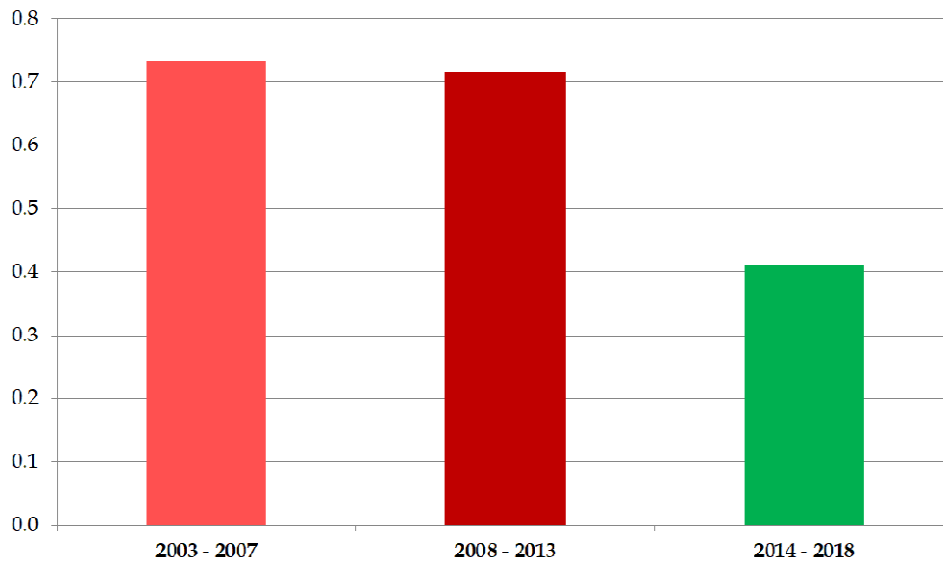
518. Significantly, the data also demonstrates that Defendants' conspiracy was not limited to those years. Again, bid/ask spreads were more consistent from 2003 to 2007 than in 2014 to 2018—and for several currency pairs, even *more* consistent than they were in 2008 to 2013. This further confirms that Defendants' conspiracy was not limited to 2008 to 2013, but also extended to and had at least equal impact on 2003 to 2007.

519. For example, the graph below tracks the predictability of bid/ask spreads for BRL/USD spot transactions from 2003 to 2018. The data shows that bid/ask spreads for this currency pair were significantly more predictable in 2008 to 2013, than they were in 2014 to 2018, when news of Defendants' conspiracy broke. Notably, the level of predictability was *even greater still* in 2003 to 2007.



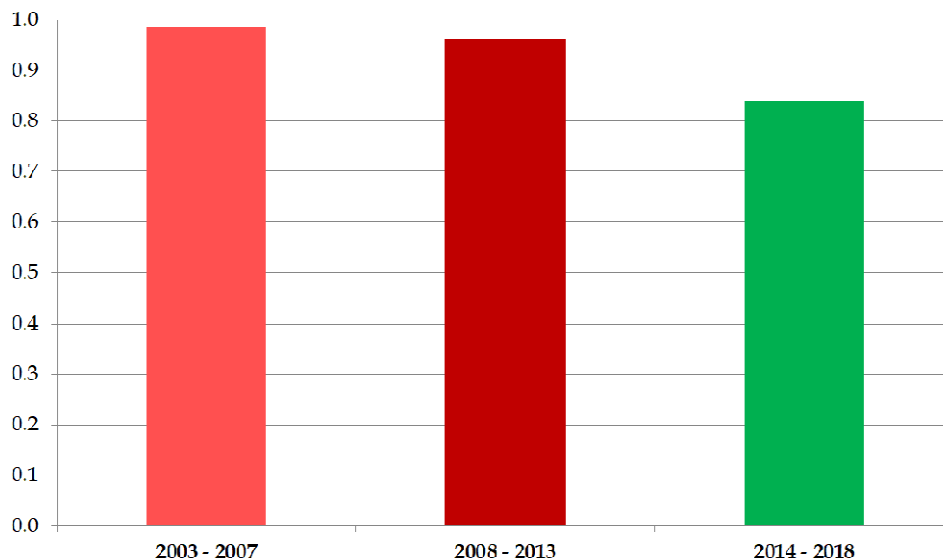
520. The graph above tracks average dollar spreads. When instead tracking percentage spreads, the same pattern of substantially increased predictability is seen, across many currency pairs, and across the entire 2003 to 2013 period. For example, the graph below measures the predictability of average percentage spreads for BRL/USD transactions. During both the 2003 to 2007 and 2008 to 2013 periods, there was significantly higher predictable than in 2014 to 2018, when Defendants' misconduct in the FX market came under public scrutiny. Notably, the level of predictability for this currency pair was *even higher* still in 2003 to 2007, than in 2008 to 2013.

Predictability of Daily Average Percentage BRL/USD Spot Spreads is Larger in 2003 - 2013
 (as Measured by the Autocorrelation Coefficient of Average Spreads)

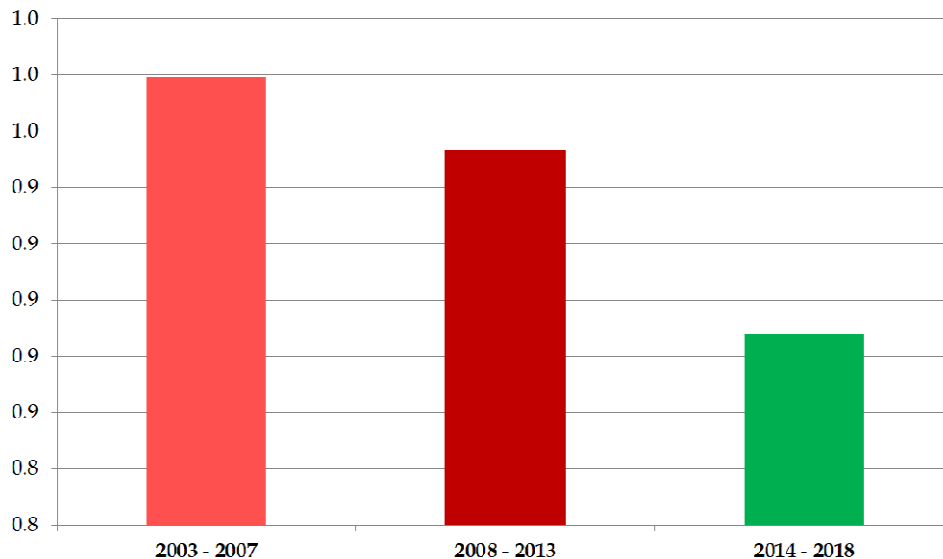


521. The same pattern is seen for GBP/USD spot transactions. Bid/ask spreads for that currency pair were significantly more predictable in 2008 to 2013 than they were in 2014 to 2018, and even more consistent still in 2003 to 2007.

Predictability of Daily Average GBP/USD Spot Spreads (Levels) is Larger in 2003-2013
 (as Measured by the Autocorrelation Coefficient of Average Spreads)



Predictability of Daily Average Percentage GBP/USD Spot Spreads is Larger in 2003-2013
 (as Measured by the Autocorrelation Coefficient of Average Spreads)



522. Additional examples showing a similar pattern in the average spreads for other currency pairs are contained in Appendix N hereto.

3. Defendants' spreads were disproportionately larger than non-defendants' spreads, until the FX scandal broke

523. Another way to confirm that Defendants conspired to charge artificially high spreads is by comparing the spreads charged by Defendants to those charged by non-defendant dealers. Plaintiffs thus analyzed the bid/ask spreads submitted by all dealers on the highest-turnover currency pairs. For a given currency pair, all bid/ask spreads reported by Reuters were divided into "upper bin" and "lower bin" categories, representing the upper half and lower half of the total bid/ask spread range, respectively.

524. Absent a price-fixing conspiracy, Defendants would compete with each other and with other dealers to offer their clients the lowest bid/ask spread. Defendants' spreads should have composed approximately the same proportion of each "upper" and "lower" category. For example, for a given currency pair, if Defendants submitted a total of 45,000 quotes and non-

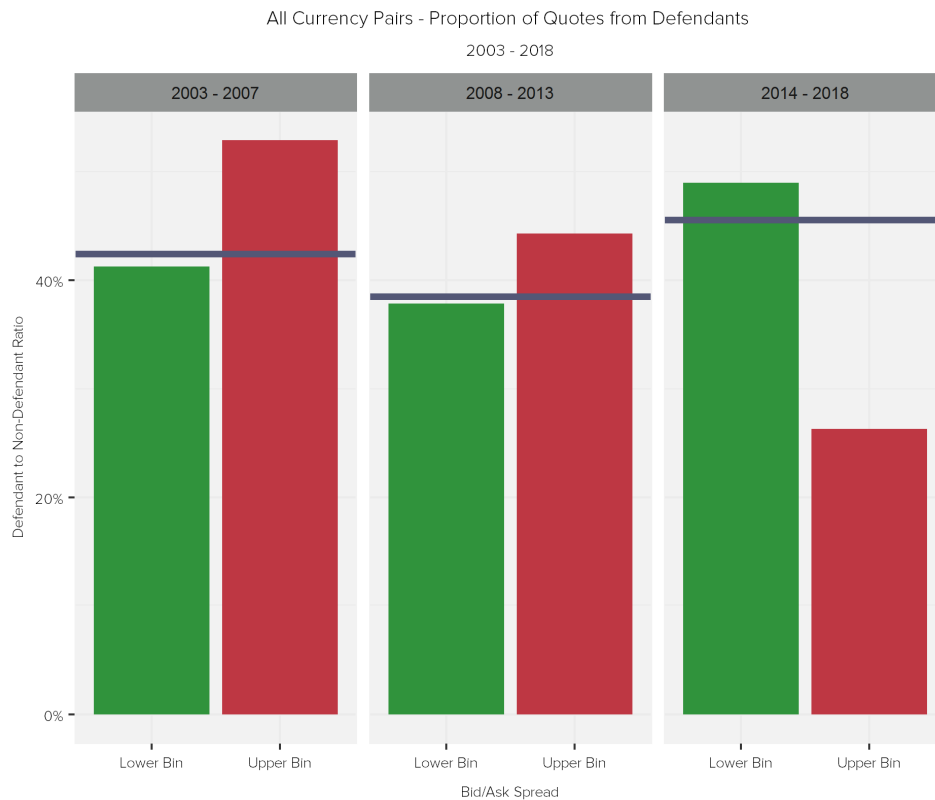
defendants submitted 55,000 quotes, Defendants' quotes should comprise approximately 45% of all quotes in both categories. In reality, this was not the case. From 2003 to 2013, Defendants' bid/ask quotes made up a disproportionately large segment of the "upper" category for most of the currency pairs analyzed, which indicates that Defendants conspired to artificially inflate their spreads in order to generate higher fees.

525. Consistent with a break in the conspiracy, this pattern reversed after news of the FX scandal broke. Forced into free competition with non-defendant dealers and each other, Defendants could no longer rely on their price-fixing conspiracy to dominate the "upper" bin of spreads. Rather, Defendants' quotes were more frequently in the "lower" bin, from the 2014 to 2018 period.

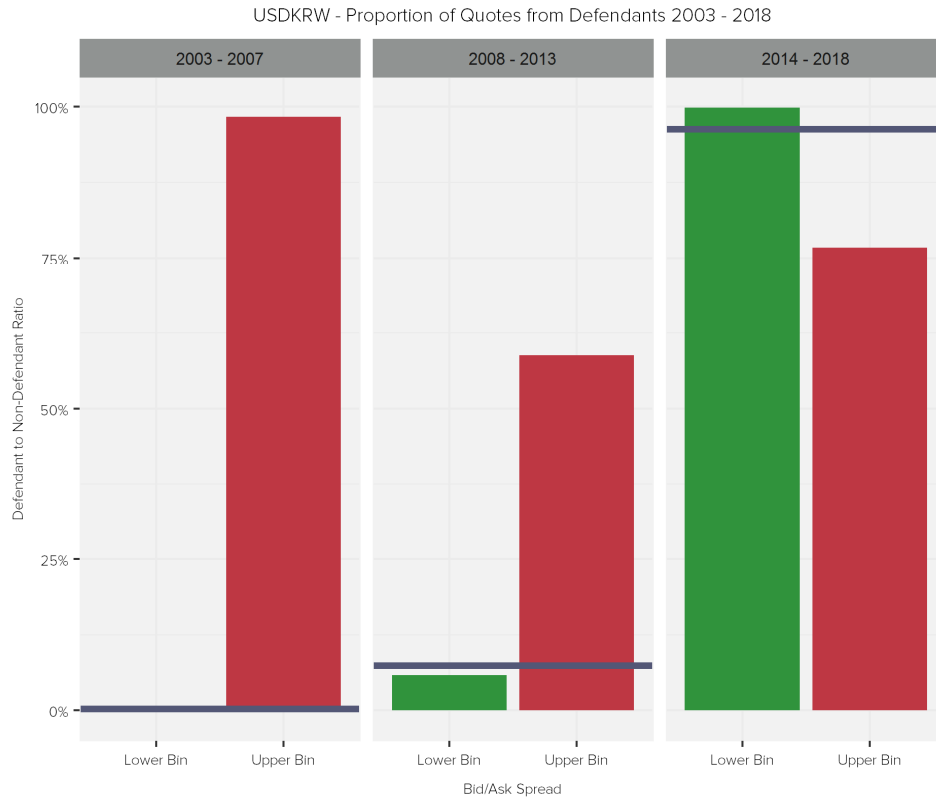
526. The charts below show the results of this study for all currency pairs analyzed. The dark-blue line represents the percentage share of the total amount of the quotes analyzed that the Defendants were responsible for. Thus, in the far-left portion of the chart, representing the 2003 to 2007 period, it can be seen by the line that Defendants were responsible for around 41% of the quotes studied. In the middle portion, representing the 2008 to 2013 period, it can be seen by the line that Defendants were responsible for around 39% of the quotes studied. Finally, in the right-most portion of the chart, representing the 2014 to 2018 period, it can be seen by the line that Defendants were responsible for around 47%.

527. Within each time period studied, one would expect, absent a conspiracy to keep their spreads wide, that Defendants' quotes would fall into both the lower and upper ranges at roughly the same frequency as their overall activity level. From 2003 to 2013, however, that is not the case. Throughout that time, we see Defendants being responsible for an outsized portion of the upper-range spreads. Significantly, these results are seen in both the 2008 to 2013 period,

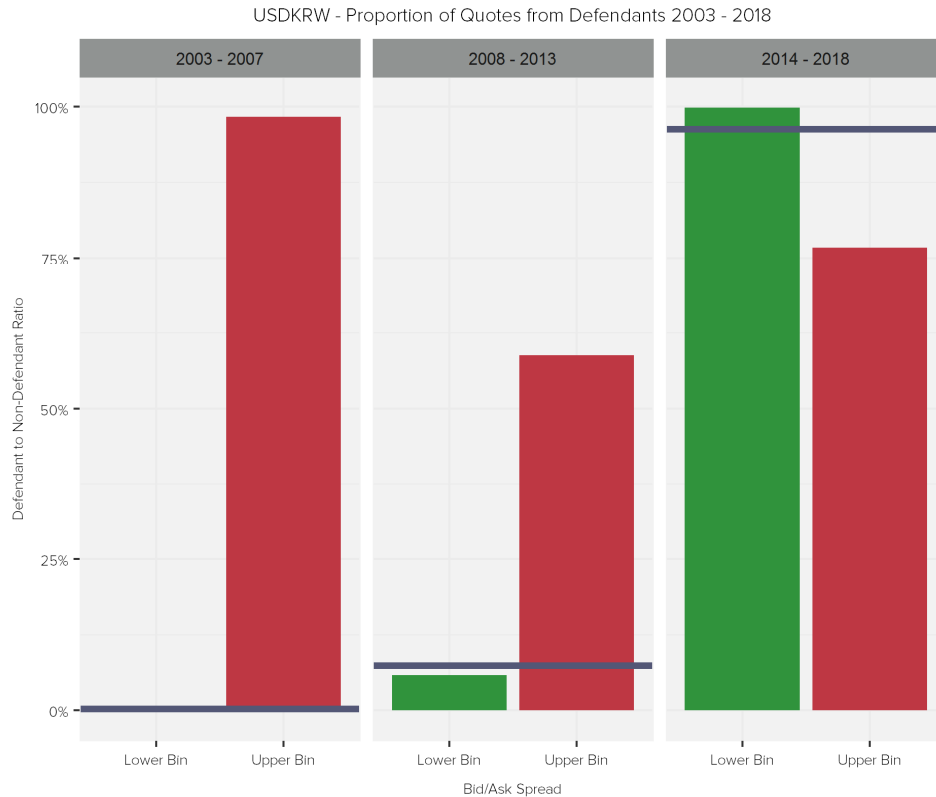
when Defendants have admitted to manipulating the FX market, and in the 2003 to 2007 period. This further confirms that Defendants' conspiracy was not limited to 2008 to 2013, but also extended to and had at least equal impact on 2003 to 2007. In the bars on the far right, for the 2014 to 2018 period, we can see that this trend reversed itself after news of the FX scandal broke. There, Defendants are seen for the first time being responsible for a disproportionately *smaller* share of the upper-range quotes.



528. The same patterns can be seen across many of the individual currency pairs analyzed. For instance, Defendants submitted the majority of the quotes in the high-spread category for USD/KRW from 2003 to 2013, despite the fact that they submitted less than 5% of the total amount of quotes for USD/KRW during this same time period. That trend reversed once the FX scandal broke. From 2014 to 2018, Defendants quotes were much more evenly distributed, and more frequently fell in the “low” category.



529. Similarly, in both 2003 to 2007 and 2008 to 2013, Defendants submitted approximately 40% of the total amount of quotes for USD/JPY, yet they submitted *over 80%* of the quotes in the high-spread category for this currency pair. This is further evidence that Defendants colluded to artificially inflate bid/ask spreads. Again, the pattern reversed in 2014 to 2018, when Defendants were forced to compete freely, and as a result much more frequently charged spreads in the “low” category.



530. Additional examples showing that Defendants submitted a disproportionately large amount of “high-spread” quotes for many other currency pairs are contained in Appendix O hereto.

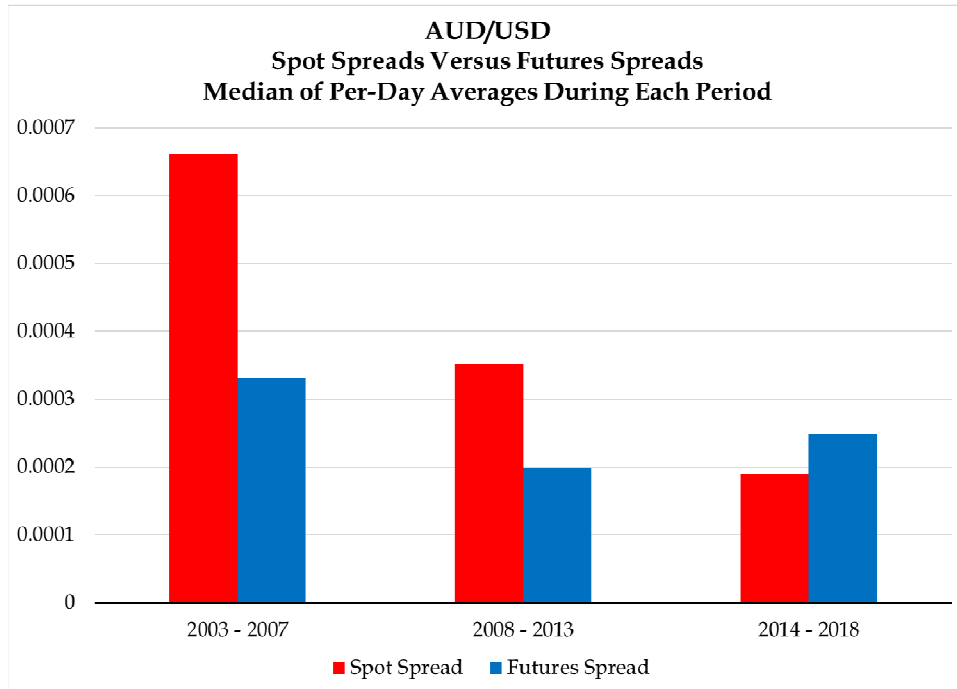
4. The relationships between spot spreads and futures spreads changed after the FX scandal broke

531. Another way to detect abnormalities in the bid-ask spreads for FX spot transactions, is to study those spreads in comparison to spreads for FX futures. As discussed above, the spot and futures markets are closely related. Absent collusion, one would expect spot and futures spreads and prices to be subject to the same market forces, and to have a consistent relationship with each other across time periods. The data show that, instead of staying consistent, key relationships between the spot and futures markets changed once Defendants’ manipulations came under public scrutiny. These changed patterns further confirm that Defendants’ persistently inflated spot spreads until their scheme was exposed. Significantly, the

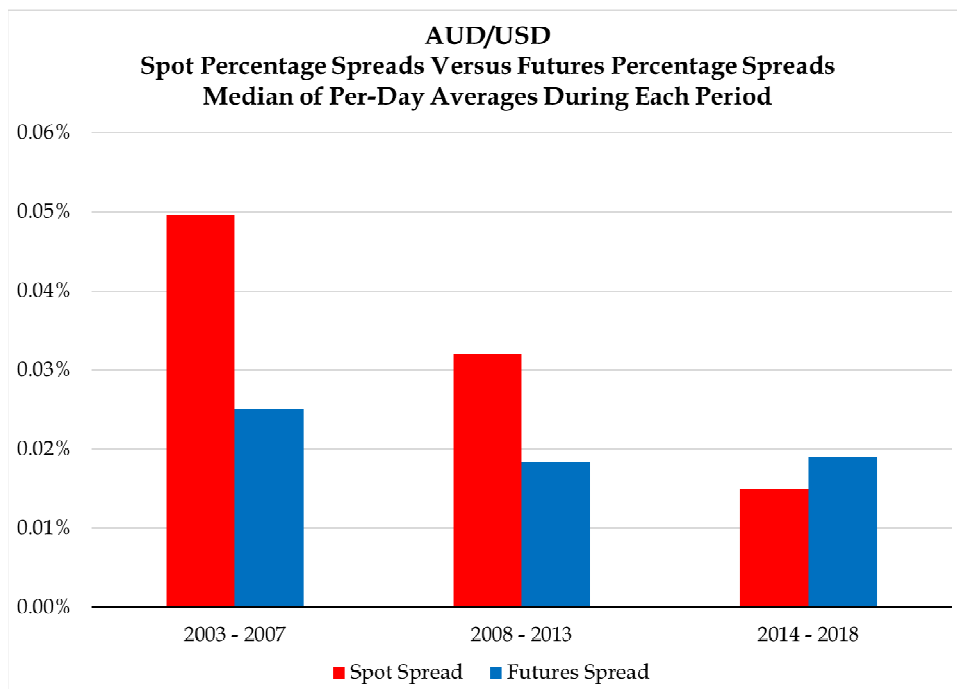
data also confirm that the signs of spreads manipulation were just as pronounced in the 2003 to 2007 period, as they were in 2008 to 2013.

532. *Spot spreads were consistently higher than futures spreads, but that trend reversed when the FX scandal broke.* First, Plaintiffs compared the sizes of spot and futures spreads throughout 2003 to 2018. Throughout 2003 to 2013, spot spreads were consistently larger than futures spreads. However, after 2013, the relationship between futures spreads and spot spreads changed, with spot spreads decreasing significantly. This change in the relationship between spot spreads and futures spreads is a further indication that spot spreads had been artificially inflated in the 2003 to 2013 period.

533. For example, the chart below shows that throughout 2003 to 2013, spot spreads (which are shown by the red bars) were much higher than futures spreads (which are shown by the blue bars) for the AUD/USD currency pair. Significantly, the size difference was even greater in 2003 to 2007, than it was in 2008 to 2013, further confirming that defendants' artificial inflation of spot spreads extended to the early period. The trend reversed when defendants' FX manipulations came under public scrutiny. From 2014 to 2018, AUD/USD spot spreads dropped below futures spreads.



534. Similarly, on a percentage basis, during both 2003 to 2007 and 2008 to 2013, spot spreads for AUD/USD were approximately double the futures spreads for AUD/USD. Then, from 2014 and continuing until 2018, AUD/USD spot percentage spreads dropped below CAD/USD futures percentage spreads.



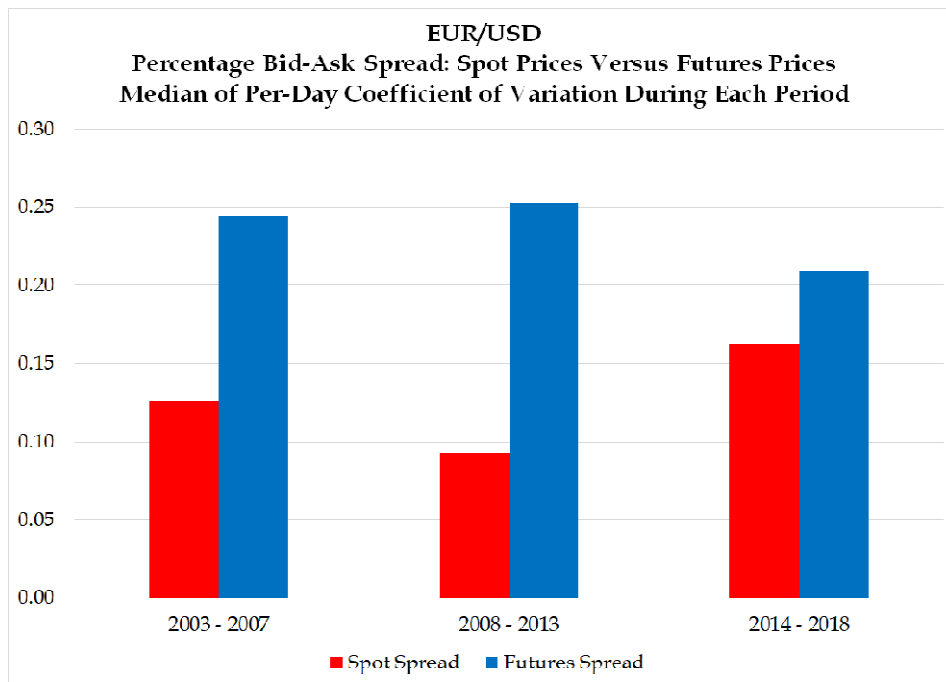
535. Additional examples showing that, for many other currency pairs, the relationship between spots spreads and futures spreads changed after 2013, when news of Defendants' misconduct in the FX market came into public view, are contained in Appendix P hereto.

536. *Spot spreads were significantly less dispersed than futures spreads before the FX scandal broke.* Plaintiffs next analyzed the levels of dispersion of spreads in both the spot and futures markets. As discussed above, levels of dispersion can be measured by the "coefficient of variation" between prices or quotes in a group. A greater coefficient of variation means a greater level of dispersion (i.e., less clustering), whereas a lower coefficient of variation means a lower level of dispersion (i.e., more clustering). In a normally functioning market, spreads will maintain a high level of dispersion, as a result of participants individually tailoring their buy and sell offers to the ebbs and flows of the market. When spreads have a higher level of dispersion/are more closely clustered together, that is sign that the market is not functionally freely, but that major participants are colluding to fix spreads.

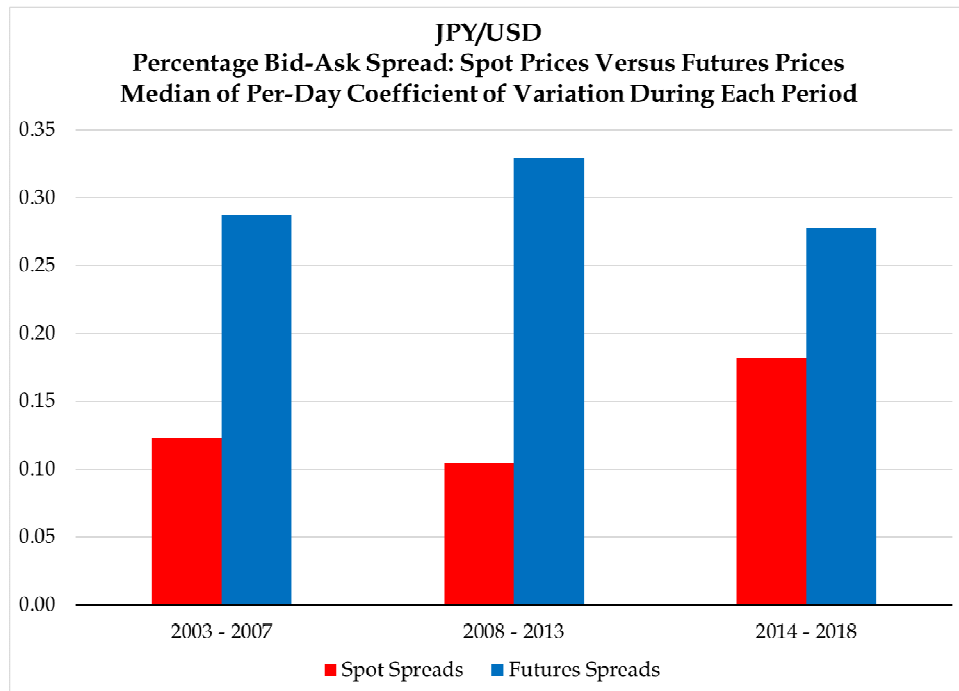
537. The data show that spot spreads were being set at artificial levels throughout the 2003 to 2013 period. Across the major currency pairs studied, spot spreads were significantly less dispersed (i.e., more closely clustered) than futures spreads, throughout the 2003 to 2013 period. That gap shrunk once Defendants' manipulations came under scrutiny. From 2013 to 2018, not only did the total variability of spot spreads increase, but also the differences between the variability of spot and futures spreads lessened, becoming more similar to each other.

538. For instance, the chart below shows the coefficient of variation for spot spreads (with the red bars) and futures spreads (with the blue bars) for the EUR/USD currency pair, from 2003 to 2018.

539. The data shows that spot spreads had a significantly lower coefficient of variation (i.e., they were significantly less dispersed/more closely clustered) than futures spreads during both the 2003 to 2007 and 2008 to 2013 periods. In 2014 to 2018, the coefficient of variation for spot spreads significantly increased (i.e., they became significantly more dispersed/less closely clustered), both in isolation, and relative to futures spreads. This confirms that spot spreads for this currency pair were artificial throughout 2003 to 2013, until Defendants' manipulations came under public scrutiny.



540. Similarly, in regards to the JPY/USD currency pair, the data show that the coefficient of variation for JPY/USD spot spreads increased substantially after 2013, thereby becoming less clustered, and became more similar to the coefficient of variation for JPY/USD futures spreads. This is further evidence that Defendants colluded to manipulate the bid/ask spreads they offered to customers throughout the 2003 to 2013 period.



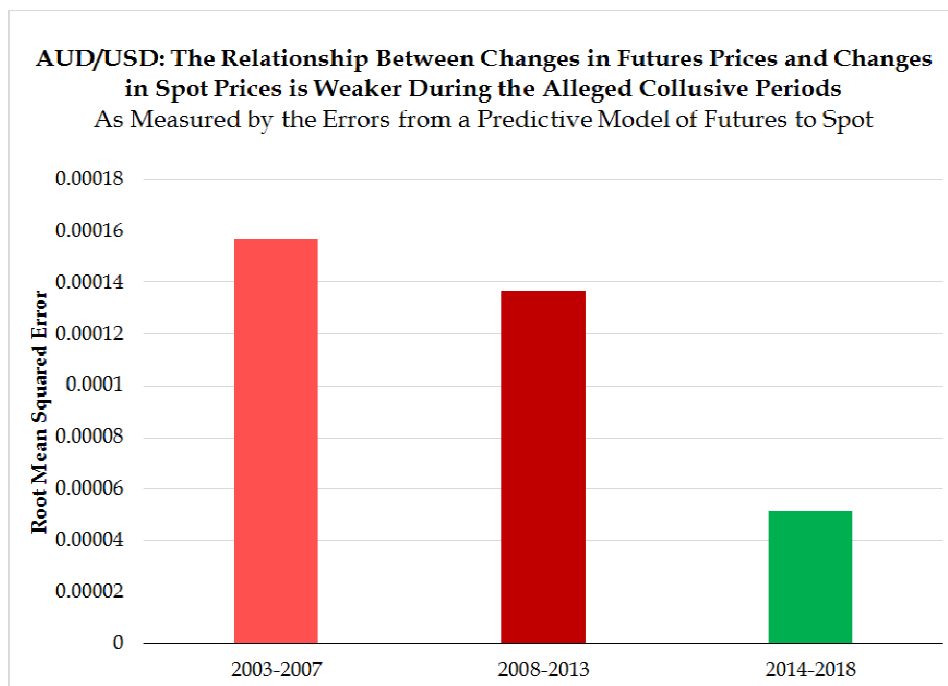
541. Additional examples showing that, for many other currency pairs, spot spreads became more dispersed and approached the same level of dispersion as futures spreads after 2013, are contained in Appendix Q hereto.

542. *Futures prices were less predictive of spot prices during 2003 to 2013, than after the FX scandal broke.* Plaintiffs also studied the predictive ability of futures prices over spot prices. This was done by using a regression model that compared minute-by-minute changes in futures prices to minute-by-minute changes in spot prices. In a normally functioning market, one would expect the ability of futures prices to predict spot prices to stay roughly the same across time periods. Instead, the data show that futures prices were significantly less predictive of spot prices during the 2003 to 2013 period than they were in 2014 to 2018, after news of Defendants' manipulations broke. This is additional evidence that spots prices were set at artificial levels, as a result of Defendants' conspiracy, throughout the 2003 to 2013 period.

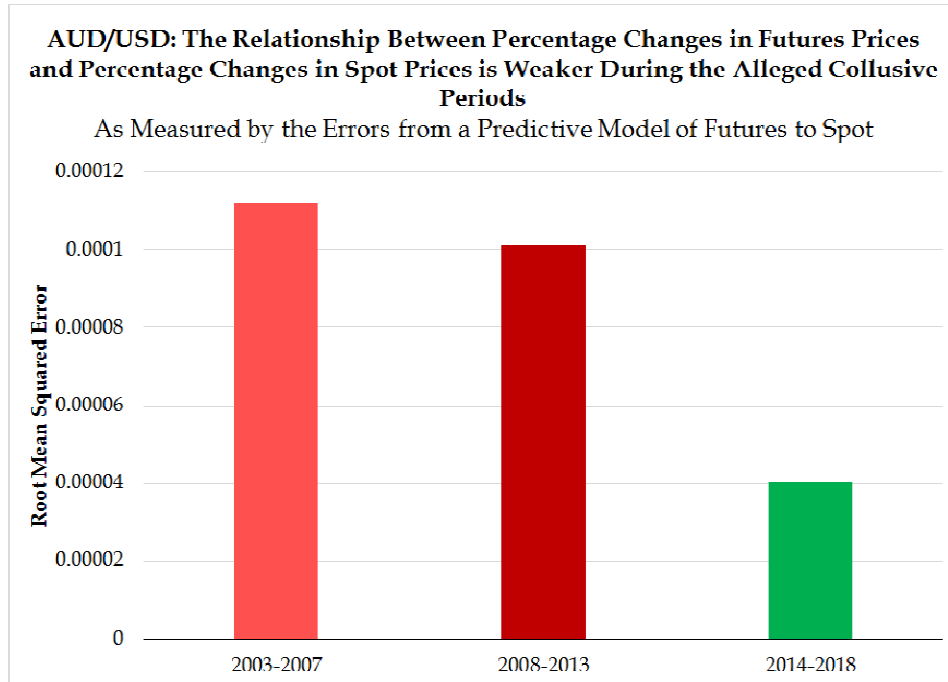
543. One way to see the change in the relationship between futures and spot prices is by the "error rate" of the predictive model. A higher error rate means that futures prices were

less predictive of spot prices, whereas a lower error rate means that futures prices were more predictive of spot prices.

544. For example, the graph below shows that, for the AUD/USD currency pair, the error rate of the predictive model was much higher throughout 2003 to 2013 than it was in 2014 to 2018. In other words, spot prices for this currency pair moved far more in line with futures prices after the FX scandal broke, than they did before. Significantly, the error rate was highest in the 2003 to 2007 period, which further confirms that Defendants' scheme was in at least equal effect during those early years.



545. The graph above tracks price movements on an average dollar basis. When instead tracking price movements on a percentage basis, the same pattern of substantially decreasing error rates is seen, across many currency pairs. For example, the graph below shows that the error rate for the AUD/USD currency pair was also at its highest in 2003 to 2007, and at its lowest in 2014 to 2018, when measured on a percentage basis.



546. Additional examples showing that, for many other currency pairs, the error rate of the predictive model was significantly higher throughout 2003 to 2013 than it was in 2014 to 2018, are contained in Appendix R hereto.

IV. BY COLLUDING TO MANIPULATE FX PRICES, BENCHMARKS, AND BID/ASK SPREADS, DEFENDANTS RESTRAINED TRADE, DECREASED COMPETITION, AND ARTIFICIALLY INCREASED PRICES, THEREBY INJURING PLAINTIFFS

A. Defendants are Horizontal Competitors

547. Defendants are, and were during the relevant period, horizontal competitors in the FX market, whether it be FX spot transactions, FX options transactions, FX futures transactions, FX options on futures, or anything else.

548. In the FX market, Defendants compete against each other in both their capacities as dealers and as direct market participants. For instance, as the primary dealers of FX spot and forward transactions, Defendants compete against each other for customers of FX spot and forward instruments. As dealers, Defendants compete for customers by offering spot and futures

transactions at competing terms, including bid/ask spreads. Defendants also compete against each other by entering FX spot and forward transactions as direct market participants (e.g., as buyers and sellers). In that capacity, Defendants compete with each other, and all other market participants, by seeking profits from taking positions in the FX spot and forwards market.

B. Defendants' Manipulation of FX Prices, Benchmarks, and Bid/Ask Spreads Directly Impacted the Market For FX Transactions

549. Defendants' conduct constitutes a *per se* violation of the antitrust laws because of its clear and obvious risk of inflicting anticompetitive impact and economic injury. Defendants operated as a secretive cartel and engaged in a price-fixing scheme that inherently reduced the free and unfettered competition the Sherman Act was designed to preserve and promote. Defendants' scheme to manipulate prices and benchmark rates directly and immediately impacted the market for FX transactions of all kinds—including spots, forwards, swaps, options, and futures. To the extent some of those types of FX transactions may be considered distinct market segments, Defendants' scheme immediately impacted each of those as well.

550. Instead of acting as competitors, Defendants agreed to restrain trade in order to pursue collective goals and to manipulate the market by collusion and coordination, as described above. Defendants' collusive price fixing was inimical to competition and restrained trade in the affected market (and any applicable market segments).

551. For instance, as set forth above, Defendants used telephone calls, electronic chat rooms, and other forms of communication to coordinate the timing of execution of transactions as to distort the measurement of "the market" during key times of the trading day. Defendants' collusive conduct warped the interplay of supply and demand. Absent collusion, Defendants would have competed to offer competitive prices by quoting bids and asks to customers at the lowest cost for a given currency in the spot market, and by participating independently as buyers

and sellers of futures and options on FX exchanges. All transactions should have been carried out based on free and open competition—not based on joint effort by the market’s primary participants to collusively time the execution or non-execution of FX transactions.

552. All of these acts were undertaken for the purpose of, and had the actual effect of, manipulating prices in the FX market. The intentional, artificial price movements had a significant impact on all FX transactions. The effects of Defendants’ collusive manipulation of the above-described market were purposeful and intended to maximize Defendants’ profits.

C. Plaintiffs, as Participants in the FX Market, Were Injured by Defendants’ Collusive Conduct

553. Plaintiffs were participants in the market for FX instruments and were affected by artificial movements in the prices in the FX market, caused by Defendants’ cartel.

554. As alleged herein, the damage to Plaintiffs flows from the injury to price competition caused by Defendants.

555. As discussed above, the manipulation here and its impacts were *pervasive* throughout the relevant period. Plaintiffs—who entered into a significant number of FX transactions during the relevant period—were injured by Defendants’ manipulation of FX prices and other benchmark rates in multiple ways.

556. For example, Plaintiffs purchased, sold, settled, and/or rolled over FX transactions expressly linked to the WM/Reuters Closing Rate, the ECB rate, and other benchmark rates and at the same time Defendants were manipulating prices around those benchmark fixing windows. Defendants’ concerted manipulation of the FX market directly impacted the prices of FX transactions completed around these times. Simply put, those that bought when prices were being inflated were harmed because they paid too much. And those that sold when prices were being suppressed were harmed because they received too little. Paying supra-competitive prices

is the prototypical example of an antitrust injury, and directly stems from Defendants' collusive behavior.

557. Plaintiffs were also harmed when they purchased, sold, settled, and/or rolled over FX transactions of all types at artificial prices that were the result of Defendants' conspiracy to inflate FX bid-ask spreads.

558. To be clear, Defendants' repeated machinations caused harm not just on FX transactions contractually linked to or executed around a manipulated benchmark (which Plaintiffs held), or on transactions on which Defendants directly inflated the bid-ask spread (which Plaintiffs also did). Rather, the harm extended to trades outside those windows as well. It is well-accepted in the market microstructure literature that transactions done at artificial prices impact the pricing of trades for some time afterward. This is because the trades are perceived to convey previously private information to the market about the value of the thing being traded. Efficient markets quickly assimilate this new information when forming the next price, and the one after that. Thus, much as a false financial statement from a company can still be reflected in the price of a company's stock long after the false statement was made—as long as the truth has not yet been revealed—so too was the level of artificiality in prices caused by these artificial trades reflected in the prices of FX transactions throughout the relevant period.

559. The injuries to Plaintiffs are of the type the antitrust laws were designed to prevent and flow from that which makes Defendants' acts unlawful.

560. Defendants' anticompetitive conduct had severe adverse consequences to competition in that Defendants artificially ensured advantageous market movements in the FX market—including the segments for FX spot, forwards, futures, and options and futures—by exchanging confidential customer information and agreeing to concerted traded strategies, such

as front running, banging the close, and painting the screen, based on aggregate customer order flow information. Under the facts alleged herein, Plaintiffs could not escape such conduct because Defendants are collectively the dominant FX spot dealers and major participants in the market for FX spot and futures transactions.

561. As a direct, foreseeable, and proximate result of Defendants' unlawful collusion and overt acts alleged herein, Plaintiffs have been injured in their business and property, in amounts that are presently undetermined.

V. EQUITABLE TOLLING OF THE STATUTE OF LIMITATIONS DUE TO DEFENDANTS' CONCEALMENT OF THE CONSPIRACY TO MANIPULATE FX PRICES, BENCHMARKS, AND BID/ASK SPREADS

562. Defendants actively, fraudulently, and effectively concealed their collusion, as alleged herein, from Plaintiffs and other investors.

563. Due to Defendants' efforts to conceal their collusive conduct, and their campaign to avoid its detection, Plaintiffs could not, through the exercise of reasonable diligence, have learned of facts indicating that Defendants were colluding to manipulate prices, benchmark rates, and bid/ask spreads in the market prior to June 12, 2013, when *Bloomberg* first reported of the possibility that Defendants were rigging currency rates. In fact, Plaintiffs were not on notice based solely on the contents of the June 12, 2013 Bloomberg article, but rather not until later, when government actions revealed previously concealed evidence of Defendants' conspiracy to manipulate the FX market. As a result of Defendants' fraudulent concealment, all applicable statutes of limitations affecting Plaintiffs' claims have been tolled.

564. Defendants' conspiracy was by its nature secretive and self-concealing. Defendants used non-public methods of communication, such as private chatrooms and text messages, to conceal their agreements to manipulate FX prices. The chatrooms were operated by high-ranking traders, and Defendants strictly limited access to the chatrooms. Defendants often

agreed, in the chatrooms, to not publically discuss or otherwise reveal and nature and substance of the chats. The substance of the conversations in the chatrooms was unknown to Plaintiffs until government actions revealed previously concealed evidence of Defendants' conspiracy to manipulate FX benchmark rates. Even then, it was not until the entry of guilty pleas by four Defendants on May 20, 2015, that evidence of collusion to manipulate bid/ask spreads was publically available.

565. Defendants actively and jointly undertook trading strategies designed to conceal their collusive conduct, such as "painting the screen" or executing phony transactions, so that even diligent investors could not detect Defendants' manipulation of exchange rates.

566. Defendants also used false pretenses to collude, executing agreements to rig FX prices while operating under the guise of legitimate corporate communications. For instance, as alleged above, Defendants were members of the Bank of England's London Foreign Exchange Joint Standing Committee, and using the cover of their membership, as part of the chief dealers' subgroup, Defendants met and reached agreements to manipulate the prices. These meetings concerned trading strategies that were in no way connected to legitimate work of the subgroup. When concerns were privately raised at a Bank of England meeting over possible manipulation for WM/Reuters Closing Rates, according to chatroom transcripts reviewed by people that spoke with *Bloomberg*, the Defendants acted jointly and through chatrooms to disguise their conduct.

567. While regulators such as the United Kingdom Financial Conduct Authority, the U.S. Department of Justice criminal and antitrust divisions, the U.S. Commodity Futures Trading Commission, the U.S. Federal Reserve, the New York Attorney General's Office, the Office of the Comptroller of the Currency, the Swiss Financial Market Supervisory Authority, the Swiss competition authority WEKO, the Hong Kong Monetary Authority, the Monetary Authority of

Singapore, and the Dutch regulator AFM have all opened investigations, all of these investigations commenced after the publication of the initial *Bloomberg* article in June 2013.

568. Even when *Bloomberg* first reported collusion among the Defendants using chatrooms and instant messaging services, Defendants did not break ranks, but instead engaged in ongoing efforts to keep their collusion hidden. In response to inquiries from the reporter, the banks refused to comment and offered phony justifications for their communications.

569. Throughout the relevant period, Plaintiffs regularly monitored their investments and conducted due diligence to try to avoid being harmed by financial misconduct. Practically speaking, there were limits to what could be done, given that so much of the foreign exchange market was shrouded in secrecy due to Defendants' conduct.

570. Reasonable due diligence could not have uncovered Defendants' conspiracy because (1) Defendants' trades and trading strategies are not public information; and (2) the bilateral, non-exchange traded nature of the spot trades further obscures what Defendants were, and are, doing at any particular time.

571. As a result of the self-concealing nature of the price-fixing conspiracy, the active steps taken by Defendants to fraudulently conceal their conspiracy and the lack of public information concerning material aspects of the conspiracy, the statute of limitations was tolled for Plaintiffs' claims.

572. The first of many antitrust class action suits on behalf of those who engaged in FX transactions was filed on November 1, 2013. Plaintiffs were originally included in the defined class in many of the antitrust class actions, which asserted the same causes of action, against the same Defendants, as are named in this Complaint. Plaintiffs reasonably and justifiably relied on the named plaintiffs in the FX class actions to protect their rights, and they

reasonably and justifiably relied on the class-action doctrine articulated in *American Pipe & Construction Co. v. Utah*, 414 U.S. 538 (1974), and other similarly applicable doctrines, to satisfy the statutes of limitations on their claims. Under *American Pipe*, all proposed class members are treated as if they filed their own individual actions, until they either opt out or a certification decision excludes them. *American Pipe*, 414 U.S. at 255. Accordingly, the claims here are deemed to have been brought as of the date they or similar claims were brought in the related class actions, and therefore the FX class actions tolled Plaintiffs' claims.

CAUSES OF ACTION

FIRST CAUSE OF ACTION

VIOLATION OF 15 U.S.C. § 1 AGREEMENT RESTRAINING TRADE (Against All Defendants)

573. Plaintiffs reallege each preceding and succeeding paragraph as though fully set forth herein.

574. This count is against all Defendants.

575. Defendants and their unnamed co-conspirators entered into and engaged in a combination and conspiracy in an unreasonable and unlawful restraint of trade in violation of Section 1 of the Sherman Act, 15 U.S.C. § 1, *et seq.*

576. As a direct, material, and proximate result of Defendants' violation of §1 of the Sherman Act, Plaintiffs have suffered injury to their business and property, within the meaning of §4 of the Clayton Act, throughout the Class Period.

577. Plaintiffs are entitled to treble damages for Defendants' violations of §1 of the Sherman Act under §4 of the Clayton Act.

578. Plaintiffs and members of the Class are also entitled to an injunction against Defendants, preventing and restraining the violations alleged above, under §16 of the Clayton Act.

SECOND CAUSE OF ACTION

UNJUST ENRICHMENT (Against All Defendants)

579. Plaintiffs reallege each preceding and succeeding paragraph as though fully set forth herein.

580. This count against each Defendant for its transactions in which that Defendant or its affiliate was in a direct or quasi-contractual relationship with Plaintiffs.

581. Because of the acts of Defendants and their co-conspirators as alleged herein, Defendants have been unjustly enriched at the expense of Plaintiffs.

582. Plaintiffs seek restoration of the monies of which they were unfairly and improperly deprived, as described herein, by way of FX transactions entered into with Defendants or their co-conspirators.

PRAYER FOR RELIEF

WHEREFORE Plaintiffs pray for relief as follows:

An award in favor of Plaintiffs against Defendants, jointly and severally, for all damages sustained as a result of Defendants' wrongdoing, in an amount to be proven at trial, but including at a minimum:

A. That the unlawful conduct alleged herein be adjudged and decreed to violate Section 1 of the Sherman Act;

B. That Defendants, their subsidiaries, affiliates, successors, transferees, assignees and the respective officers, directors, partners, agents, and employees and all other persons

acting or claiming to act on their behalf, be permanently enjoined and restrained from continuing and maintaining the conspiracy alleged in the Complaint;

C. Damages as provided under federal antitrust laws, and that a joint and several judgment in favor of the Plaintiffs be entered against Defendants in an amount to be trebled in accordance with such laws;

D. The monetary losses suffered by Plaintiffs, including from inflated payments to Defendants, reduced payments from Defendants, and losses incurred during the termination process in an amount to be determined at trial;

E. Consequential damages;

F. Punitive damages;

G. Attorneys' fees and costs;

H. Prejudgment interest at the maximum legal rate;

I. Rescission;

J. Indemnification; and

K. Such other and further relief as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(a) of the Federal Rules of Civil Procedure, Plaintiffs demand a jury trial as to all issues triable by a jury.

DATED: New York, New York
November 7, 2018

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